

# **Understanding the translation of evidence-based nutrition practice into daily routines in centre-based childcare**

by

**Louisa Matwiejczyk**

*Thesis*

*Submitted to Flinders University*

*for the degree of*

**Doctorate of Philosophy**

College of Nursing & Health Sciences

August, 2020

# Table of Contents

1	Chapter One: Introduction.....	1
1.1	Introduction.....	1
1.2	Thesis structure.....	3
1.3	Terminology.....	5
2	Chapter Two: A review of the Literature, the ECEC Sector and Children’s Rights .....	6
2.1	Introduction: Child nutrition, health and the public health response.....	6
2.2	Children’s diet and health .....	8
2.2.1	Dietary patterns of Australian children .....	9
2.2.2	Prevalence of overweight and obesity in children .....	11
2.2.3	Consequences of diet-related chronic conditions in children.....	12
2.2.4	Preventative public health efforts in children .....	15
2.3	Public health response .....	15
2.3.1	National public health policy .....	15
2.3.2	State public health policy response.....	18
2.3.3	Whole-of-government public health response .....	19
2.4	The ECEC setting and determinants influencing nutrition-related behaviours and food environments .....	20
2.4.1	Introduction .....	20
2.4.2	An overview of the ECEC sector.....	21
2.4.3	A review of the ECEC sector and centre-based childcare.....	25
2.5	Centre-based childcare as a determinant of healthy eating habits.....	29
2.5.1	The childcare food environment .....	29
2.5.2	The childcare social environment.....	33
2.5.3	Childcare and the information environment.....	39
2.5.4	Childcare and the policy environment.....	41
2.6	Effectiveness of centre-based childcare nutrition best practices in Australia .....	52
2.6.1	Introduction .....	52
2.6.2	Effectiveness of multi-strategy interventions.....	53
2.6.3	Effectiveness of interventions targeting food provision .....	53
2.6.4	Effectiveness of policy changes .....	54
2.6.5	Interplay between individual factors and the childcare environment.....	55

2.6.6	Interplay between agency and social structure .....	55
2.7	Summary comment.....	<b>Error! Bookmark not defined.</b>
2.8	Children’s rights to optimal nutrition.....	58
2.8.1	Introduction .....	58
2.8.2	Children’s rights and the United Nations Convention on the Rights of the Child (UNCRC).....	59
2.8.3	The United Nations Convention on the Rights of the Child.....	60
2.8.4	Government responsibility as a duty-bearer .....	61
2.9	Children’s rights and the responsibility hierarchy .....	62
2.10	Children’s rights, diet and health .....	63
2.10.1	Children’s rights and optimal nutrition.....	64
2.10.2	Children’s rights to a healthy food environment.....	65
2.10.3	Children’s rights to healthy nutrition and acting in a child’s best interest .....	67
2.11	ECEC policy commitment to children’s rights .....	68
2.12	Children’s rights and nutrition in ECEC settings .....	72
2.12.1	Child rights to optimal nutrition (art 24.) .....	72
2.12.2	Child rights to information and education (art 17.).....	73
2.12.3	Educators providing best practice (art. 28) and supporting the best interests of the child (art 3.).....	74
2.12.4	Child rights to a voice.....	74
2.13	Framework to examine children’s rights to the provision and promotion of healthy eating; Child Rights Situation Analysis .....	75
2.14	Summary; is healthy eating in childcare a human right? .....	76
2.15	Research question, aims and objectives .....	78
2.15.1	What is known? .....	78
2.15.2	What is not fulfilled?.....	80
2.15.3	What are the gaps in knowledge? .....	81
2.15.4	What needs to be examined? .....	82
2.15.5	Research aim and objectives .....	83
3	Chapter Three: Epistemology, Methodology and Methods .....	85
3.1	Introduction.....	85
3.2	Epistemology .....	85

3.3	Methodology .....	86
3.4	Theoretical perspectives and frameworks .....	87
3.4.1	The Ecological Model of Health Behaviour .....	90
3.4.2	Child Rights Situation Analysis .....	93
3.5	Method .....	96
3.5.1	Data collection .....	98
3.5.2	Data Analysis .....	98
3.5.3	Interpretation .....	101
3.5.4	Reflexivity .....	101
3.6	Rigor .....	103
3.7	Ethical considerations .....	105
4	Chapter Four: Characteristics of Effective Interventions Promoting Healthy Eating for Pre-Schoolers in Childcare Settings: An Umbrella Review .....	107
4.1	Introduction .....	109
4.2	Materials and Methods .....	111
4.2.1	<i>Search Strategy and Eligibility Criteria</i> .....	111
4.2.2	<i>Assessment of Methodological Quality and Data Extraction</i> .....	112
4.3	Results .....	113
4.3.1	<i>Study Selection Process</i> .....	113
4.3.2	<i>Description of Reviews</i> .....	116
4.3.3	<i>Findings of the Reviews</i> .....	122
4.3.4	<i>Characteristics of Successful Interventions</i> .....	125
4.3.5	<i>Review Recommendations</i> .....	127
4.4	Discussion .....	128
4.4.1	<i>Implications for Practice and Policy</i> .....	129
4.4.2	<i>Evidence Gap</i> .....	131
4.4.3	<i>Limitations of the Studies</i> .....	133
4.4.4	<i>Limitations and Strengths of the Umbrella Review</i> .....	134
4.5	Conclusions .....	135
	<b>References</b> .....	136
5	Chapter Five: Factors Influencing Nutrition-related Practices and Environments in Centre-based Child Care Settings: Childcare Providers' Perspectives .....	142

<b>Study 1: Factors Influencing Food Service Provision Decisions in Centre-based Early Childhood Education and Care Services: Cooks’ Perspective .....</b>	<b>143</b>
5.1 Introduction.....	145
5.2 Method.....	147
5.3. Results.....	149
5.4. Discussion.....	156
5.5. Conclusion.....	162
<b>Study 2: Factors Influencing Nutrition-related Decisions in Centre-based Childcare: Directors’ Perspective .....</b>	<b>166</b>
5.1. Introduction .....	166
5.2. Method .....	167
5.3. Results.....	171
5.4. Discussion.....	195
5.5. Conclusion.....	203
<b>Study 3: Factors Influencing Nutrition-related Decisions in Centre-based Childcare: Decision-makers’ Perspective .....</b>	<b>206</b>
5.1. Introduction .....	206
5.2. Method .....	209
5.3. Results.....	211
5.4. Discussion.....	235
5.5. Conclusion.....	240
<b>6 Chapter Six: A synthesis study and Child Rights Situation Analysis of nutrition practices while in centre-based childcare .....</b>	<b>242</b>
6.1 Introduction.....	243
6.2 Method.....	245
6.3 Results .....	246
6.3.1 Child Rights Situation Analysis: Issue identification .....	246
6.3.2 Child Rights Situation Analysis: Causal analysis.....	247
6.3.3 Child Rights Situation Analysis: Relevant rights at risk of not being realised..	254
6.3.4 Child Rights Situation Analysis: Roles and responsibilities analysis and capacity analysis	259
6.4 Discussion.....	269
<b>7 Chapter Seven: Discussion .....</b>	<b>272</b>

7.1	Introduction.....	272
7.2	The policy-environment .....	274
7.2.1	Policy attributes enabling translation.....	274
7.2.2	Policy attributes constraining translation.....	275
7.3	Structural factors and the centre-based childcare environment .....	281
7.3.1	Structural enablers for translation .....	281
7.3.2	Threats constraining structural enablers.....	282
7.4	Factors at the individual-level and knowledge transfer .....	287
7.5	Societal changes impacting translation .....	292
7.6	Enablers and barriers influencing nutrition best practice translation .....	293
7.7	Introduction.....	295
7.8	Healthy eating at centre-based childcare as a human right .....	296
7.9	The extent of centre-based childcare support for children’s rights to optimal nutrition and healthy food environments .....	298
7.10	State Parties support for children’s rights to optimal nutrition and healthy food environments.....	300
7.10.1	State Parties roles at the state and federal policy level .....	300
7.10.2	State’s obligation to support non-state actors.....	301
7.10.3	States are failing.....	301
7.11	Responsibility and failure to realise rights .....	302
7.11.1	Public Health policy is ineffectual .....	302
7.11.2	Public Health is failing our children morally and legally.....	304
7.11.3	Public Health Law.....	306
7.11.4	Responsibility and Accountability.....	307
7.12	Centre-based childcare as protective places.....	308
7.13	Summary.....	311
8	Chapter Eight: Conclusion.....	313
8.1	Recap of research.....	313
8.1.1	Context.....	313
8.1.2	Translation of evidence-based nutrition practices into day-to-day routines..	314
8.1.3	Implementation drivers and barriers.....	316
8.1.4	Fulfilment of children’s rights to healthy nutrition .....	317

8.2	Implications for public health policy and practice .....	318
8.2.1	Policy measures and a call for a policy brief .....	318
8.2.2	ECEC Sector strategies and call for centres as a protected place.....	321
8.3	Implications for further research .....	324
8.3.1	Call for translating evidence from trials into routine practices.....	325
8.3.2	Call for a system-thinking study.....	327
8.3.3	Examining modern food trends (including allergies).....	328
8.3.4	Examining cross-setting differences and multifarious interventions bridging the two settings.....	329
8.3.5	Call for monitoring and longitudinal and baseline research .....	329
8.3.6	Application in similar settings.....	330
8.4	Limitations.....	330
8.4.1	Methods and rigor .....	331
8.4.2	Theoretical frameworks.....	333
8.5	Conclusion .....	336
9	References .....	338
10	Appendices.....	376

## List of Tables

Table	Title	Page
Table 2-1	National policy examples with the potential to influence healthy eating and physical activity in children	16
Table 2-2	State and territory policy actions relating to nutrition and childcare services 2011-2019	18
Table 2-3	Nutrition-related standards, elements and selected reflective questions from the <i>National Quality Standards</i> for each of the seven Quality Areas (ACECQA 2018)	41
Table 2-4	National Regulations underpinning the National Quality Standard and Element 2.1.3 and selected assessment criteria for meeting the element	44
Table 2-5	Comparisons between centre-based childcare menu-planning guidelines for each state and territory	48
Table 2-6	Factors associated with promoting healthy eating in young children in centre-based childcare under the four environments (suggested by Hawkes et al., 2016): food, social, information, policy (Hawke et al., 2016).	51
Table 2-7	UNCRC articles relevant to nutrition in centre-based childcare services (OHCHR 1989) and where the article is referred to in the ECEC policies (ACECQA 2018)	69
Table 4-1	Key characteristics of the selected systematic reviews	116
Table 4-2	Summarised research and practice recommendations by review authors	127
Table 5-1	Interview schedule for centre-based early education and care cooks exploring their perceptions of factors influencing food-decisions	146
Table 5-2	Characteristics of 14 early education and care cooks and centre-based childcare services participating in semi-structured interviews, South Australia	149
Table 5-3	Sampling rationale for selecting centre-based childcare centres for director interviews, South Australia	167
Table 5-4	Interview schedule for centre-based childcare directors exploring factors influencing nutrition-related decisions	169
Table 5-5	Characteristics of 13 early care and education directors (n=13 centres) participating in semi-structured interviews exploring factors that influence nutrition and food-related decisions, South Australia	171
Table 6-1	Immediate, underlying and structural barriers and causes to translating nutrition best practice into routines	252
Table 6-2	Roles and responsibilities of key duty bearers and their capacity to realise children's rights to optimal nutrition and healthy food environments in centre-based childcare, South Australia	266



## List of Figures

Figure	Title	Page
Figure 2-1	Use of centre-based childcare services and workforce participation percentages for mothers in Australia	23
Figure 2-2	The National Quality Framework and directional policies for centre-based childcares	26
Figure 2-3	National Quality Areas and criteria for assessment and rating of centre-based childcare services	27
Figure 2-4	The 'Hierarchy of Responsibilities' depicted as nested rings of responsibility for duty-bearers around the child (developed from Kent, 1994 p.358)	62
Figure 3-1	A conceptual framework of the central role of theory in Qualitative Research	87
Figure 3-2	Flowchart of the process of undertaking a Child Rights Situation Analysis	94
Figure 3-3	Flowchart of the steps undertaken in the analysis of the data from cooks, directors and influential decision-makers	99
Figure 4-1	PRISMA flowchart of the selection process for systematic reviews	114
Figure 4-2	List of summarised multi-strategy, multi-level intervention characteristics	129
Figure 5-1	Themes from thematic analysis of semi-structured interviews of 14 early care and education cooks exploring factors which influence childcare decision-making relating to food and nutrition, South Australia	150
Figure 5-2	Levels of influence and themes from interviewing 13 centre-based childcare directors exploring factors which influence decision-making relating to food and nutrition, South Australia	172
Figure 5-3	Themes (and sub-themes) from a thematic analysis of semi-structured interviews with influential Early Childhood Education and Care (ECEC) decision-makers	212
Figure 6-1	Individual, centre, sector and societal level factors influencing nutrition practice in centre-based childcare	250
Figure 6-2	List of duty-bearers using the nested hierarchy of responsibility regarding children's rights to optimal nutrition in centre-based childcare	264
Figure 8-1	The SkolmatSverige instrument and its components	326

## Appendices

Appendix	Title	Page
Appendix-1	Nutrition-related standards, elements and selected reflective questions from the National Quality Standards for each of the seven Quality Areas (developed from ACECQA 2018; ACECQA 2020)	374
Appendix-2	Sampling grid for selecting centres from which participants were interviewed	379
Appendix-3	Letter of introduction, information sheet and consent form examples	380
Appendix-4	Table S1: Record of search strategies for umbrella review	384
Appendix-5	Table S2: Critical appraisal results for the included reviews using 11 critical appraisal criteria (The Johanna Briggs Institute, 2014)	395
Appendix-6	Table S3: Characteristics of included systematic reviews	396
Appendix-7	Table S4: Summary of the evidence from selected reviews using the Johanna Briggs Institute data extraction checklist (Johanna Briggs Institute 2014)	402
Appendix-8	Codebook example for coding of directors' interviews	413
Appendix-9	Professional development suggestions and other solutions from centre-based personnel	419
Appendix-10	Current nutrition-related programs supporting centre-based childcare services in Australian states and territories	422

## Summary

**Purpose:** Society is judged by how well it supports its most vulnerable, particularly the very young. According to the United Nations Convention of the Rights of the Child (UNCRC), to which Australia is a signatory, a fundamental right of every child is entitlement to healthy nutrition, the conditions that support this and the prevention of non-communicable diseases. However, in Australia, not all children obtain this with a substantial proportion of children consuming poor diets and one in five children up to the age of four being overweight or obese. Despite considerable public health efforts to promote healthy eating and prevent obesity, children's diets and obesity prevalence are getting worse. As such children do not enjoy their rights to the fullest attainment of health.

What children eat, their food preferences and nutrition-related behaviours are shaped by multifarious factors, including the environment they live in and the influence of those around them. Traditionally, this influence has primarily been the family setting but over the last 30 years changes to mothers' workforce participation has seen most Australian children cared for in non-parental childcare. In this setting, children can receive up to two-thirds of their daily nutrition. Consequently, centre-based childcare has become an important setting for influencing children's lifelong healthy eating patterns at an influential developmental age.

Many positive dietary outcomes have been attributed to interventions in centre-based childcare. However, the translation of nutrition best practices into day-to-day routines is better achieved when expert or researcher led and less well achieved when left to the early education and care sector to enact. Little is known about the barriers or implementation drivers that contribute to this evidence-to-practice gap or the perspectives of childcare personnel who implement these practices.

To better enable centre-based childcare services, researchers, policymakers and public health planners address this evidence-to-practice gap in the early education and care sector (EEC), this study aimed to (1) investigate the barriers and facilitators to translating evidence-based nutrition best practice into daily routines and (2) examine to what extent centre-based childcare services support children's rights to optimal nutrition and healthy food environments.

**Method:** Using the Ecological Model of Health Behaviour as a theoretical framework, qualitative research informed by grounded theory was undertaken. Interviews included cooks (n=14), directors (n=13) and influential decision-makers (n=7) from 33 centre-based childcare services in South Australia, using maximum variation sampling. Guided by the Child Rights Situation Analysis framework, the findings from the thematic analysis of the three empirical studies, and an umbrella review of 12 systematic reviews, were further examined using a child rights-based approach.

**Results:** Findings from this research identified some novel determinants at the individual, centre, institutional and societal levels of influence which impacted the centre-based childcare environment and decision-making of cooks, directors and influential decision-makers. Acting as both barriers and implementation drivers, these determinants influenced the food, social and information environment and underpinning systems. Unique to this research was the national accreditation system, which drove continuous improvement and shaped childcare providers' beliefs, nutrition-related decisions and practices as well as influencing enabling environments. Structural factors crucial to this were the role of the directors, as well as having a designated cook. Directors determined the centre's strategies which the cooks and educators operationalised, whereas designated cooks ensured healthy food provision.

Nevertheless, these enablers were under threat and unsustainable. Threatening these positive practices were: constraints as a result of the NQS' limitations on the enactment of nutrition best practice; an absence of pre-requisite, system-wide professional development; a lack of nationally consistent supporting resources and menu planning guidelines; increasing societal-driven demands threatening the sustainability of having cooks; and dissonance where the salutogenic approach of the NQS and early education and care sector policy objectives intersected with nutrition policy objectives. As such, nutrition best practice is enacted from goodwill and the positive practices seen are unsustainable.

Moreover, it would appear from the Child Rights Situation Analysis that children in childcare do not have the conditions and services needed for them to fully realise their nutrition-related rights. Governments have the authority and the resources to support centres but do not take responsibility for fulfilling their UNCRC obligations. Whereas, centre-based childcare services

and supporting organisations, have the authority but not the resources and motivation is equivocal. As such, both governments and the early education and care sector are not providing the conditions and services needed for our children to achieve their fullest attainment of health.

**Implications:** The significance of this research is that the relevant UNCRC provisions can be invoked to mobilise governments, the EEC sector, policymakers and public health planners to strengthen the conditions and services needed to support children’s nutrition. Findings from the research undertaken as part of this doctorate informs policymakers, program planners and the early childhood sector on strategies to maximize the translation of nutrition best practice into daily routines. A greater understanding ensures better targeted investment in policy and healthy eating interventions in the early childhood sector. Improving conditions and services requires a comprehensive approach involving a range of strategies, underpinned by the NQS and the UNCRC so that decisions are weighted in favour of realising children’s rights including their entitlements to good health. To create and sustain these conditions, a culture must exist where child nutrition and children’s rights, to the fullest attainment of health, are prioritised. As such, there is an urgency to prioritise nutrition within the EEC policy environment and establish relevant system-level support, training and strategies.

**Conclusion:** Overall, as a society we are failing our children. In partnership with parents, centre-based childcare services are the ideal ‘protective places’ for creating the conditions and services for children to develop lifelong healthy eating habits and prevent obesity. For positive practices to be sustained and further gains made, it is imperative that governments support and resource the early education childhood sector to fulfil children’s rights to health. The process of increasing the capacity of duty-bearers to achieve children’s rights is as important as the outcome. As a signatory to the UNCRC, governments have the responsibility to implement all measures to fulfil children’s nutrition-related rights and to prioritise it. Given the phenomena of childcare in other similar countries, findings from this research may be relevant to governments and the early childhood sector internationally or in similar settings. Ensuring healthy food provision and learning environments for lifelong, healthy eating is a worthy investment in our children’s national health and education.

## Declaration

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university, and that to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed

Date.....May 22nd, 2020.

## Acknowledgements

To my principal supervisor, Professor John Coveney, thank you for your supervision over the years, for your guidance, keen intellect and inimitable expertise and for your understanding around my needs as a full-time academic with a family. To my associate supervisor, Associate Professor Kaye Mehta, my deepest gratitude for your sage advice, wisdom, generous support, inspiration and valued mentoring. A special thankyou too to my 'critical friend', Professor Jane Scott, for your pragmatic advice and for keeping me focused on my goal.

To my work friends and neglected non-work friends, thank you for your support, conversations and for always knowing the right things to say.

Importantly, I would like to thank the Early Childhood Education and Care (ECEC) participants and stakeholders that I have had the honour to work with in my research. Thank you for your generous time and for your commitment and dedication to making children's lives the best that they can be. The ECEC sector is in good hands.

From the depths of my heart, I would also like to thank my family. A PhD is a privilege but also a selfish pursuit. I am in debt to your unconditional support, unwavering belief in me and constant encouragement. To my patient husband, Rick, my amazing adult children, Isadora and Samuel, my inspiring mother and my extended family across Australia, 'thank you'.

Lastly, to my beautiful father, Karol Matwiejczyk, forever in my heart, cheering me on and giving me strength during those 'witching' PhD hours. *Odważny, hojny człowiek.*

## **Publications arising from this thesis**

### **Peer reviewed journal articles**

**Matwiejczyk, L.,** Mehta, K., & Coveney, J. (2019). Factors influencing food service provision decisions in centre-based early childhood education and care services: Cooks' perspective. *Health Promotion Journal Australia* doi: 10.1002/hpja.308.

**Matwiejczyk, L.,** Mehta, K., Scott, J., Tonkin, E., & Coveney, J. (2018). Characteristics of Effective Interventions Promoting Healthy Eating for Pre-Schoolers in Childcare Settings: An Umbrella Review. *Nutrients*, 10(3), 293-314.

**Matwiejczyk, L** (2016). What does the research say about nutrition provided by early childcare providers? *Belonging Early Years Journal* Vol 4 (3) pp 80-82

### **Conference presentations**

**Matwiejczyk L,** Mehta K, Coveney J. (2020). Abstract accepted 01/03/2020, The translation of evidence-based nutrition practices into daily routines in centre-based childcare: Childcare providers' perspectives, International Society of Behavioral Nutrition and Physical Activity (ISBNPA), 19<sup>th</sup> meeting in Auckland New Zealand June 17-20, 2020

**Matwiejczyk L,** Samball R, Byrnes R, Love P. (2019). Best practice food and nutrition in Early Childhood Education and Care: Opportunities for Dietitians, Dietitians Association Australia 36<sup>th</sup> National Conference, workshop, Queensland, Australia, August 2019

**Matwiejczyk, L,** Mehta, K, Scott J, Coveney J. (2017). The Effectiveness of Strategies to Improve the Implementation of Healthy Eating Policies and Practices within Early Childhood Education and Care: An Umbrella Review, Austral-Asia Pacific Clinical National Nutrition Conference, presentation, Adelaide November 2017

**Matwiejczyk L,** Coveney J, Scott J, Mehta K. (2017) Building the capacity of Australian child care centres to support healthy eating. International Society of Behavioral Nutrition and Physical Activity (ISBNPA) 16<sup>th</sup> meeting in Victoria, BC, Canada, presentation, June 2017



## **Public outputs**

**Matwiejczyk L.** (2019). *Is a plant-based diet safe for children?* *First Five Years*, 11 November 2019, <https://www.firstfiveyears.org.au/child-development/is-a-plantbased-diet-safe-for-children>

**Matwiejczyk L.** (2016). *Are there health consequences to raising your children as vegetarians, vegans or pescatarians?* *The Conversation* Published March 17<sup>th</sup>, 2016

## Abbreviations

ABS	Australian Bureau Statistics	NCDs	Non-communicable diseases
ACECQA	Australian Children’s Education and Care Quality Authority	NHMRC	National Health Medical Research Council
ADGs	Australian Dietary Guidelines	NPAPH	National Partnership Agreement on Preventative Health
AGTHE	Australian Guide to Healthy Eating	NQF	National Quality Framework
ANGELO	Analysis Grid for Elements Linked to Obesity	NQS	National Quality Standards
CEB	Controlling Eating Behaviour	NSW	New South Wales
CRSA	Child Rights Situation Analysis	OECD	Organisation for Economic Co-operation and Development
DECD	Department Education Child Development	OHCHR	Office of the High Commissioner for Human Rights
DFs	Discretionary Foods	PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analysis
DMs	Decision Makers	SA	South Australia
ECEC	Early Childhood Early Care	SES	Socio-economic Status
EDNP	Energy Dense Nutrient Poor	QA	Quality Area
EYLF	Early Years Learning Framework	SEIFA	Socio-Economic Indexes for Areas
EMHB	Ecological Model of Health Behaviours	SEM	Social Ecological Model
GT	Grounded Theory	SNAC	Supporting Nutrition for Australian Childcare
HEP	Healthy Eating Policy	SRER	Start Right Eat Right
ICESAR	International Covenant on Economic Social and Cultural Rights	TDF	Transtheoretical Domain Framework
JBI	Johanna Briggs Institute	UNCRC	United Nations Convention on the Rights of the Child
		WHO	World Health Organisation

## Glossary

**Child rights-based approach:** a conceptual framework for the process of human development that is based on international children's rights standards and is implemented to promote, protect and fulfil children's human rights.

**Childcare providers:** staff who provide services to children and families using early childhood education and care services. Staff include directors, educators who work directly with the children and cooks.

**Centre-based childcare:** purpose-built childcare settings which offer education and care for children up to six years of age at least five days a week to 6 pm each day. Also called Long Day Care or Centre-based Day Care.

**Children's Centres for Early Childhood Development and Parenting:** settings that offer a mixture of education, health and family services on the same campus and are supported by the state government. Each centre offers a slightly different mix of services for children aged birth to eight years depending upon the community's needs.

**Community-based childcare centre** (also called not-for-profit community childcare centre): a service that is managed by the community. Sponsors may be local government, church organisations, recreational organisations, or independently incorporated management committees that are predominantly made up of parents.

**Convention:** a formal agreement between States (countries) covering specified matters. Conventions are open for the whole International community to participate in or by many States.

**Discretionary foods:** foods relatively high in total fat, saturated fat, added sugar or added salt and relatively low in micronutrients and dietary fibre

**Early childhood settings:** include long day care, occasional care, family day care, multi-purpose Aboriginal Children's Services, preschools and kindergartens, playgroups and Children's Centres.

**Early Childhood Education and Care:** services which provide for children from birth to eight years of age in a variety of settings.

**Early Years Learning Framework:** describes the principles, practices and outcomes that supports and extends children's learning from birth until five years when children transition to school. It assists educators to provide young children with opportunities to maximise their learning and establishes the foundations for future learning.

**Educators:** early childhood practitioners who work directly with children in early childhood settings. In South Australia cooks are referred to as educators if they have an approved certificate 111 level education and care qualification.

**Enterprises:** include the large childcare businesses such as GoodStart, Stepping Stones and G8. Some of these such as GoodStart are not-for-profit social enterprises managed by a consortium of charities.

**Intentional teaching:** involves educators being deliberate, purposeful and thoughtful in their decisions and actions. Intentional teaching is the opposite of teaching by rote.

**Long Day Care:** a centre-based service (often called a childcare centre) that provides education and care for children aged from birth to age six.

**Learning Framework:** a guide which provides general goals and outcomes for children's learning and how they might be attained. It also provides a scaffold to assist early childhood and school age care settings to develop their own, more detailed curriculum.

**National Quality Standard:** sets a national benchmark for the quality of education and care services. Centre-based childcare services are assessed and rated against the National Quality

Standard (NQS). The NQS aims to promote safety, health and wellbeing of children; a focus on children achieving outcomes through high quality educational programs; and an understanding by services and families as to what is a quality service.

**National Quality Framework:** is a national system for the regulation and quality assessment of education and care services. It applies to most long day care, preschool/kindergarten, family day care and outside school hours care services. The NQF includes three directives: the National Law, the National Regulations and the National Quality Standard. It also includes a national quality rating and assessment process, a Regulatory Authority in each state or territory that regulates services and administers the assessment and rating process, and a national body to oversee the system. The national body is Australian Children's Education and Care Quality Authority (ACECQA).

**Start Right Eat Right (SRER):** a multi-strategy, state-wide nutrition incentive scheme which aimed to strengthen nutrition practices in South Australian centre-based childcare centres between 2000-2013.

**Socio-economic status:** refers to the social and economic position of an individual, or group of people, in larger society. In Australia, the Australian Bureau of Statistics has developed the socio-economic index for areas (SEIFA) which measures relative level of disadvantage using indices from the Census. These indices can include employment, level of education, income, internet access, home ownership.

**UNCRC articles or provisions:** describe the obligations of those States choosing to be bound by it and procedural matters involving the Convention. The term 'provision' is often used as an alternative when referring to the content of articles.

# 1 Chapter One: Introduction

“The moral test of government is how that government treats those who are in the dawn of life, the children”

(Hubert Humphrey, Vice-president USA 1977)

## 1.1 Introduction

Society is judged by how well it supports and protects its most vulnerable, particularly the very young. A fundamental part of this is good nutrition which is key for good health (NHMRC, 2013). Australia is a signatory to the United Nations Convention on the Rights of the Child (the UNCRC or the Convention), and as such, children in Australia are entitled to healthy and adequate food as an integral part of a child rights for health (OHCHR, 1989). Yet, most children do not eat healthily as defined by the national dietary guidelines (NHMRC, 2013). As a result, many will bear the burden of childhood-onset obesity, intractable obesity as an adult and non-communicable disease (Charakida & Deanfield, 2018). Non-communicable diseases (NCDs) are of national and global concern (WHO, 2013; WHO, 2017) irrespective of national wealth, and are attributed in part to poor dietary food choices and overconsumption (NHMRC, 2013). Exacerbated by obesity, NCDs are the major cause of morbidity and mortality in most middle and high-income countries (Haddad et al., 2015; Finucane et al., 2011; Kyu et al., 2018; Stanaway et al., 2018) and identified as the most challenging public health issue of the 21st century (Hunter & Reddy, 2013).

Children are especially vulnerable because they are young and reliant on others to meet their needs. It is well accepted that food preferences and eating behaviours are learnt from the people supporting children and shaped by the environment in which children live (Gortmaker, 2011, Gortmaker & Taveras, 2014; Swinburn, Egger & Raza, 1999; Swinburn 2011) and that these learnt dietary patterns will track into adulthood (Birch & Doub, 2014; Harris, 2008; Nicklaus, 2016; Skinner, Carruth, Wendy & Ziegler, 2002). As such, many experts and researchers take a socio-ecological view acknowledging that the determinants of healthy eating reflect a complex number of interacting factors including the children’s

food environment and the influence of significant others in children's lives (Sallis & Owen, 2015).

A significant societal phenomenon impacting these interactions and children's food environment has been changes in mothers' workforce participation, enabled by the proliferation of childcare services (Department Education & Training, 2018) and government childcare subsidies (Department Education & Training, 2018). In these settings, children can receive up to two thirds of their daily nutritional needs (Benjamin, Neelon & Briley, 2011; Lanigan, 2012). Where once the family home was the principal influence on children's developing dietary patterns (Peters, Parletta, Campbell & Lynch, 2014), this is now shared with centre-based childcare settings.

Public health policy has in response directed preventative nutrition interventions to childcare settings (WHO, 2009, 2017). It follows that if children receive healthy food in centre-based childcare services they will develop healthy eating attitudes and behaviours and be healthier. However, evidence from interventions and strategies to improve dietary outcomes and to prevent obesity in young children attending childcare are ambivalent (Stacey et al., 2017; Wolfenden et al., 2016). Moreover, little is known about the barriers and enablers translating evidence-based best practice into day-to-day routines, or how nutrition-related practices in centre-based childcare are viewed by those who enact it. It is also unclear to what extent centre-based childcare services support a child's right to optimal nutrition and a healthy food environment.

This thesis uses two theoretical frameworks to address two central research questions generated from examining the literature with regards to children's human rights for good nutrition and nutrition in centre-based childcare. A socio-ecological lens is used to examine centre-based childcare providers' experiences and perceptions of nutrition-related practices promoting healthy nutrition. More specifically, the Ecological Model of Health Behaviour is used to answer the first central research question:

What are the barriers and facilitators influencing the translation of evidence-based nutrition practice into everyday routines enacted by childcare providers in centre-based childcare?

In doing so the following sub-questions were asked; (1) what are childcare providers' experiences and perceptions of implementing nutrition-related practices in centre-based childcare services with children aged 2-5 years? And (2) what factors influence childcare providers' nutrition-related practices and decisions in centre-based childcare services with children aged 2-5 years?

Using a child rights-based approach, childcare services were further analysed using a Child Rights Situation Analysis framework and the findings from my empirical research to answer the other central research question:

To what extent do centre-based childcare services support children's rights to optimal nutrition and healthy food environments?

## **1.2 Thesis structure**

This chapter briefly describes the purpose of my thesis including the thesis problem statement, what I hope to achieve, my research questions, and my contribution to the field. My focus is on centre-based childcare services and as such excludes preschools (also known as kindergartens). In South Australia (SA), preschools are for children who turn four before May 1st in the year before starting school. Preschools are educational sessions, government owned, have no fees and usually half day sessions and very different from centre-based childcare. Chapter Two is in two sections. Section one of Chapter Two provides critical background outlining what we know about young children's diets from the literature and the significance of promoting healthy nutrition at this age. It then goes on to describe the Australian public health policy health efforts to support nutrition practices in centre-based childcare.

For a significant proportion of young children, food provision and nutrition related practices in centre-based childcare is a key part of children's lives. Chapter Two continues with a review of nutrition-related practices in centre-based childcare including an overview of the sector. As part of this review, the determinants that influence eating behaviours and environments relevant to nutrition in centre-based childcare are discussed within four



environments posited by Hawkes et al., 2015; namely food, social, information and policy. Chapter Two continues this examination with a summary of the evidence for childcare services as effective settings for promoting healthy eating and childcare providers as agents for change. This section identifies the gaps in the literature, before moving into the second section of Chapter Two exploring healthy nutrition as a fundamental right of children.

Internationally, and in Australia, there is increasing interest in understanding unhealthy food and malnutrition as a human rights concern. Human rights instruments have been used as tools to initiate and sustain action for food policies and healthier environments for a few public health issues. The purpose of this section of Chapter Two is to explore whether healthy eating can be considered a human right in non-parental childcare and if the provisions within the UNCRC have application. A brief rationale and explanation of children's rights and the UNCRC is provided, followed by an in-depth exploration of centre-based childcare services as a setting for promoting and providing optimal nutrition from a child rights perspective. As part of this examination several provisions within the UNCRC are identified as relevant to nutrition. The final part of this chapter summarises the gaps in the literature leading into the research aims and objectives.

Chapter Three describes the research methodology and methods employed in my studies. This includes a rationale and description of the methodological approach and paradigms which underpinned my research and was used as a guide. The two theoretical frameworks employed, the Ecological Model of Health Behaviour (EMHB) and the Child Rights Situation Analysis (CRSA), are also described in more detail.

The findings from the five studies undertaken as part of this thesis are presented in Chapters Four, Five and Six. The first study presented in Chapter Four is a review of relevant systematic reviews and establishes the most recent findings and approaches undertaken in my area of interest. Three qualitative studies in childcare settings follow in Chapter Five and present a thematic analysis of stakeholders' views informed by grounded theory. Each of these empirical studies includes an introduction, method and discussion. The first two studies have been published in peer-reviewed journals (Matwiejczyk, Mehta, & Coveney, 2019; Matwiejczyk, Mehta, Scott, Tonkin & Coveney, 2018) and are presented without modifications.

The final study, a synthesis study, described in Chapter Six, discusses the summarised findings in response to the research questions, comparing the findings to the current literature and children's rights. Informed by the findings from the three empirical studies undertaken as part of this doctorate, Chapter Six goes on to present an analysis of how much childcare services support children's rights to the provision and promotion of healthy food using the CRSA framework. This analysis identifies who holds the responsibility for realising children's rights to optimal nutrition and the extent with which the childcare sector fulfils these rights.

In Chapter Seven, the discussion chapter, the two central research questions are explored further with reference to all five studies undertaken as part of this doctorate and to the literature. Notably, the literature and research in this area is rapidly evolving and has increased significantly since starting this doctorate part-time. Effort is made to capture the latest findings. The UNCRC is examined to define to what extent the provisions relevant to nutrition could be invoked to drive change.

Chapter Eight closes this thesis by outlining the relevance and public health implications of this research by discussing the associations of the findings to nutrition and the Early Childhood Early Care (ECEC) sector and to our existing understanding. The chapter concludes with the studies' strengths and limitations and recommendations for future research.

### **1.3 Terminology**

Centre-based childcare is referred to as Long Day Care by the South Australian state government and as Centre-based Day Care by the federal government. In the literature, the common term used is centre-based childcare or centre-based childcare services. To avoid confusion, the terms used in this thesis include centre-based childcare, centres and centre-based services. Similarly, there are several terms to describe personnel who work in centre-based childcare. Careproviders, provider, carer and educators are terms commonly used in the literature. In this thesis, childcare personnel are referred to as childcare providers or by their role e.g. cook.

## 2 Chapter Two: A review of the Literature, the ECEC Sector and Children's Rights

### 2.1 Introduction: Child nutrition, health and the public health response

Good nutrition is fundamental to good health, with foods that children typically consume impacting their immediate and lifelong health (NHMRC 2013). In children, healthy nutrition is crucial for healthy growth and development but also for preventing non-communicable diseases (NCDs) such as diabetes, cardiovascular diseases and some cancers and associated risk factors (Charakida & Deanfield, 2018; NHMRC, 2013). Associated risk factors include hypertension, elevated blood cholesterol levels, obesity and metabolic syndrome (NHMRC, 2013). NCDs have their origin in childhood and are the major cause of morbidity and mortality in most countries including Australia (AIHW, 2018; Stanaway et al., 2018). As such, NCDs are of considerable public health concern because of the impact to society and to individuals physically, socially and psychologically (AIHW, 2018b). Given that what we eat is a modifiable lifestyle risk factor, and that healthy eating habits and food preferences develop from an early age (Birch & Doub, 2014; Charakida & Deanfield, 2018), it is critical for children to be given the opportunity to establish protective, healthy eating habits early on in childhood.

Food preferences and eating behaviours are learnt and children learn these from parents, grandparents, caregivers, siblings and peers through socialisation from infancy (Kuczmarski & Fieldhouse, 1998, Johnson, 2016). In reality, the development of dietary eating patterns in children is influenced by a complex number of interacting factors including parents' and caregivers' beliefs, attitudes and socio-cultural relationships with food, but also by the environment in which the child lives (Patrick & Nicklas, 2005). Physical factors such as food access and availability will influence children's food consumption, as will broader social factors including socioeconomic and sociocultural determinants which contribute to the environment in which children live (Johnson, 2016, Patrick & Nicklas, 2005). The most influential environment is the home setting (Peters et al., 2014). However societal changes enabling mothers to participate in the workforce over the last three decades has impacted

on family organisation, lifestyle and dietary eating patterns with young children spending significant time in childcare during this influential developmental stage (Laughlin, 2013). To some extent, childcare services are proxies for the home and where once the family and home setting determined the development of early eating habits, childcare services now have an influential role (Larson, Ward, Neelon & Story, 2011; Lanigan 2012). Indeed, Briley & McAllaster (2011), conclude 'child-care centres have replaced the family table as the learning environment for young children's food habits' (p. 1299). This observation is supported by recent figures from the Organisation for Economic Co-operation and Development (OECD, 2019) with, on average, 87% of 3-5-year-olds enrolled in ECEC services.

Given the changes in where young children are cared for, and the importance of establishing healthy food habits from a young age, the influence of the childcare environment and nutrition-related practices of care providers on children's healthy eating habits is of paramount interest to researchers, public health experts, programmers, policymakers and families. The childcare environment impacts children's developing dietary patterns through a number of ways including: food provision (availability and access to healthy food), socialisation (educators' feeding practices and feeding style, modelling behaviours, mealtime behaviours, peer modelling), learning (curriculum programming, positive conversations) and policy (Haines et al., 2019).

Chapter Two elaborates on these associations and is in two sections. The aim of this section of the chapter is to provide critical background information and review the evidence supporting childcare services as influential environments for facilitating healthy eating habits in young children. Crucial to this, is an understanding of the influence and role of childcare providers. The chapter starts with explaining why a focus on children and children's nutrition is important before rationalising why public health efforts are directed at childcare environments and childcare providers' practices. A brief explanation of the ECEC sector and centre-based childcare is provided before a review of the evidence supporting the facilitation of healthy eating habits in centre-based childcare is reviewed. The policies and frameworks which shape these environments and practices are also studied before this section of the chapter concludes with a review of the effectiveness of Australian nutrition-related interventions in centre-based childcare settings.

The second section of this chapter introduces the child rights-based approach to reviewing nutrition related services in centre-based childcare.

## 2.2 Children's diet and health

The period from birth to starting school is one of the most critical times in children's growth and development. It is imperative that the foods offered to children during this time are adequate and health-promoting because this food provides the foundation for physiological growth and development and establishes eating patterns for life (Lynch & Smith, 2005; Horodyski & Stommel, 2005; Kaikkonen, 2013). Experts agree that early childhood is when eating patterns, food preferences, knowledge and attitude towards foods develop (Birch & Doub, 2014; Charakida & Deanfield, 2018), with most of our food-related behaviours and food preferences being established by the time we start school (Skinner et al., 2002; Nicklaus, 2009). Furthermore, longitudinal studies confirm that dietary patterns including frequency, variety and amounts of food habitually consumed track from childhood through to adulthood (Skinner et al., 2002; Mikkilä et al., 2005; Nicklaus, 2009; Birch & Doub, 2014; Charakida & Deanfield, 2018; Kaikkonen et al., 2013), impacting our current and long term health (Singh, Mulder, Twisk, van Mechelen & Chinapaw, 2008; Craigie et al., 2011). Hence the diet we are introduced to at a very early age is very influential on our health. Any setting which influences the learning of food preferences is therefore significant because once entrenched, food preferences are difficult to change (Jager, 2003 cited in Peters, 2012).

These childhood dietary patterns are of interest because diet is a key modifiable lifestyle risk factor for many NCDs and other chronic conditions such as obesity (NHMRC, 2013). By supporting populations to eat healthily at a young age, NCDs and associated conditions can be prevented (NHMRC, 2013; Charakida & Deanfield, 2018). As a result, public health effort has been directed at nutrition in young children, as reflected in international policies (WHO, 2009, WHO, 2012; WHO, 2017), that many high-income countries, including Australia, have used to inform national preventative strategies (Department of Health UK, 2011; NHMRC, 2013; HM Government, 2016; Health Canada Office of Nutrition Policy and Promotion, 2019). A preventative population focus targeting children and families is attractive to governments given the evidence that healthy eating habits develop early, are protective,

and once established track through life, reducing the risk of developing NCDs and associated conditions (Charakida & Deansfield, 2018; Kaikkonen et al., 2013).

Nevertheless, despite these efforts, governments are failing young children. Even with evidence-based recommendations and well-considered policies, Australian children's diets are typically characterised by being high in fat (particularly saturated fat), high in added sugar, high in salt and low in protective foods such as fruit, vegetables, whole grains and polyunsaturated fats (ABS, 2014; ABS, 2015; AIHW, 2018b). Moreover, diets are typically excessive in energy and at the population level are associated with an increasing prevalence of overweight, obesity and NCDs into adulthood (Flegal et al., 2013).

### **2.2.1 Dietary patterns of Australian children**

The most recent national dietary survey results from the 2011-2013 Australian Health Survey indicate that most Australian children are not meeting the recommended daily serves for vegetables, dairy foods, lean meats/alternatives and grains (Australian Bureau of Statistics, 2015; ABS, 2018; AIHW, 2018). Nearly all children aged 2-3 years are consuming the recommended number of fruit serves (97%) but only 20% are having sufficient serves of vegetables, decreasing to 3% for children aged 4-8 years (AIHW, 2018). Adequate vegetable intake in young children is vital because of vegetables' protective effect mitigating NCDs (Wang, Ouyang et al., 2014) and because lifelong food preferences develop at a young age (Birch & Doub, 2014). Results from local studies with Australian children support these trends seen in national surveys (Chalet et al., 2016; Whitrow et al., 2016); with a study of children aged 2-3 years, the findings showed that the recommended daily serves were not met for any children across all of the recommended core food groups (Chai et al., 2016).

Discretionary foods (DFs) are excluded from the core food groups because they are relatively high in the following: total fat, saturated fat, added sugar or added salt and are relatively low in micronutrients and dietary fibre (NHMRC, 2013). The problem with an excessive intake of total fat, saturated fat, added sugar and sodium as added salt, is that overconsumption of energy is associated with obesity. Dietary patterns of this type are correlated with an increased risk of developing NCDs such as diabetes, cardiovascular disease and some cancers (NHMRC, 2013). Discretionary foods are not considered an

essential part of the diet and are typically 'energy dense' and 'nutrient poor' (EDNP). More than 96% of all Australian children aged 2-4 years consume DFs daily (Johnson, Bell, Zarnowiecki, Rangan, & Golley, 2017). Results from the Australian Dietary Survey indicate that between 30% and 41% of children's total energy intake was from DFs (AIHW, 2018). This increased as the children became older, with almost a third of the total energy intake of 2-3-year-olds coming from DFs compared to 41% in 14-18-year-olds (AIHW, 2018b). DFs are undesirable because of the risk of Energy Dense Nutrient Poor (EDNP) foods replacing essential nutrients from the core food groups (Chai et al., 2016; Whitrow et al., 2016). However, although children's diets do not meet national dietary recommendations for core food groups (AIHW, 2018b), diets do appear to contain the nutrients needed by Australian children because of the large amounts of DFs consumed with necessary nutrients (Louie & Tapsell, 2015; Whitrow et al., 2016). The main issue with DFs is its contribution to overconsumption as well as excessive total fats, saturated fat, salt and added sugar in young children's diets (Johnson et al., 2017; NHMRC, 2013).

In summary, Australian children's current dietary pattern is not consistent with national dietary guidelines (Chai et al., 2016; Johnson et al., 2017; NHMRC, 2013) and for the majority of children, does not meet daily food group recommendations as prescribed by the Australian Guide to Healthy Eating (NHMRC, 2013b). Children's diets are characterised by excessive amounts of EDNP discretionary foods, a lack of serves from protective core food groups and overconsumption. Increased portion sizes of foods have also been attributed to overconsumption, contributing to an excessive energy intake (Collins et al., 2014). At a population and public health level, these dietary patterns raise concerns given the association of excessive energy, high saturated fat intake and low vegetable intake with an increased risk of developing multiple chronic conditions such as obesity and NCDs including diabetes, cardiovascular diseases and some cancers (Park et al., 2013; Guariguata et al., 2014; Wang et al., 2014). In very young children, this is of particular concern because food preferences and dietary patterns develop early, are repeatedly reinforced, and track into adulthood.

### 2.2.2 Prevalence of overweight and obesity in children

Childhood obesity, as a result of overconsumption, is of global concern because of the significant impact obesity has on a child's immediate health, educational attainment and quality of life (WHO, 2016). Childhood obesity has short term and long-term health outcomes with social, physical and psychological consequences, and is reaching alarming rates worldwide. Prevalence rates of obesity in children have doubled or tripled over the last 30 years in all high income countries, most middle income countries and an increasing number of low income countries (Sassi, 2009; Finucane et al., 2011; International Food Policy Research Institute, 2014; Ng et al., 2014). Data from 188 countries, including Australia, showed that the prevalence of overweight and obesity combined rose by 47% for children between 1980 and 2013 (Ng et al., 2014).

In the most recent report of the ABS 2017-2018 National Health Survey results (AIHW, 2020), rates of overweight and obesity in children aged 5-14 years have remained more or less the same since 2007 at 24% (7.7% obese and 17% overweight) with more girls obese or overweight than boys (27.1% compared to 23.6% respectively (AIHW, 2018)). For very young children, aged 2-4 years, rates of overweight and obesity are less at 21% according to ABS 2014-2015 data (AIHW, 2018b) and have not been reported from the ABS 2017-2018 data. While there is evidence that childhood obesity rates appear to have stabilised in Australia (Olds, Tomkinson, Ferrar & Maher, 2009; Olds et al., 2011; AIHW, 2020), current rates are nevertheless unacceptably high across the whole population and increasing within particular sub-populations (AIHW, 2020; Hardy et al., 2019; Wheaton et al., 2014; Zulfiquir et al., 2018). Sub-populations where overweight and obesity prevalence rates are increasing include children aged 5-14 years in remote and rural areas (AIHW, 2020), children with one parent (AIHW, 2020) and children from diverse backgrounds such as immigrants (Zulfiquir et al., 2018; Hardy et al., 2019). An analysis of data from the Longitudinal Study of Australian Children for nearly 5,000 children aged 4-5 years over seven years found an inverse relationship between socioeconomic position and persistence of overweight or obesity (Wheaton et al., 2014). There is a lack of data which reports heights and weights of children less than five years and therefore a dearth of studies investigating obesity rates in children less than five years old.



Although childhood obesity levels are stabilizing in most high-income countries (Abarca-Gomez et al., 2017; Olds et al., 2011), prevalence has started to increase with sharp rises in pre-school aged children in high-income countries such as the USA (Skinner et al., 2018). Moreover, childhood obesity is considered a significant public health issue because of the increasing rates of severe obesity with central adiposity (Baur, 2019), which is associated with poor health outcomes (Lee et al., 2010). Researchers anticipate that the severity of childhood obesity will continue to worsen (Charakida & Deanfield, 2018; Sabin, Kao et al., 2015) despite significant improvements in Australian children's health over the last 50 years.

Obesity has been described as the major health challenge of the 21st century (Hunter & Reddy, 2013) because despite concerted interventions, no country has seen a decline in the incidence of childhood obesity over the last three decades (Ng et al., 2014), including Australia, albeit prevalence appears to be plateauing (Abarca-Gomez et al., 2017; Olds et al., 2011). Moreover, once established, obesity is intractable to treat (Skinner et al., 2018). Obesity is insidious and affects low, middle and high income countries across all ages, including very young children, and all facets of society (Finocane et al., 2011, Gortmaker et al., 2011; Ng et al., 2014). As such, obesity is of concern to the physical, psychological well-being and social impact on the child (Swinburn et al., 2011; Ng et al., 2014).

### **2.2.3 Consequences of diet-related chronic conditions in children**

Many children who are overweight or obese do not outgrow their extra weight (Charakida & Deansfield, 2018; Ferraro et al., 2003; Lee et al., 2010; Cunningham et al., 2014). Children at kindergarten who are carrying excessive weight may become adolescents with obesity (Cunningham et al., 2014), and most preadolescent children with excessive weight become adults with obesity (Charakida & Deansfield, 2018, Reilly et al., 2003; Reilly, 2006; Freedman et al., 2005). Notably, more than 70% of adolescents who are obese will remain so into adulthood (Reilly et al., 2003; Reilly, 2006) with childhood onset obesity in adults very difficult if not impossible to treat (Queensland Health, 2010; Skinner et al., 2018). Further complicating this phenomenon, individual treatments focusing on childhood overweight or obesity can exacerbate the condition (Lumeng, 2017; Robinson et al., 2017), which calls for sensitive management.

### *Prevalence of NCDs in children*

Furthermore, childhood and adolescent obesity that continues into adulthood is associated with a higher risk of premature death and disability (Lee et al., 2010). As well as an independent risk factor for adult obesity, childhood obesity is an independent risk factor for adult morbidity due to NCDs, including diabetes and associated conditions such as metabolic syndrome (Kramer, Zinman, & Retnakaran, 2013). In longitudinal studies, results have shown that NCDs which develop in the early ages are more difficult to treat, more aggressive and associated with more serious health consequences (Boa et al., 1996; Abdullah et al., 2012; AIHW, 2018b). Of particular public health concern is the development of diabetes in children. Where once type 2 diabetes was considered a disease of the middle aged and older (Centres for Disease Control and Prevention, 2014), it has since emerged in child populations (D'Adimo & Caprio, 2011; Centres for Disease Control and Prevention, 2014). Internationally, this phenomenon has been attributed to increases in obesity (Abdullah et al., 2012), with 85% of children diagnosed with diabetes being obese or overweight (American Diabetes Association, 2000).

In young people in Australia, the risk of type 2 diabetes has risen substantially (AIHW, 2014), and is similar to rising trends and figures reported for the UK (Haines et al., 2019), Canada (Amed et al., 2010), and NZ (Jefferies et al., 2012). As more young adults and children develop NCDs, governments are bracing for the increased costs and resources needed to support physical, social and psychosocial complications (Abdullah et al., 2012).

### *Psychosocial implications of childhood onset chronic conditions*

There is evidence that children who are overweight or obese are also at a greater risk of social isolation and the development of psychological disorders compared to those in the healthy weight range (Libbey, Story, Neumark-Sztainer & Boutelle, 2008). Children carrying excessive weight experience more teasing, discrimination, bullying, poor peer relationships, low self-esteem and poor school experiences than their peers (Libbey et al., 2008; Crowle, 2010; Sanders, Han, Baker, & Cobley, 2015). Humiliation and discrimination are experienced from not only their peers and other adults, but from their health carers and from their teachers (Lynagh, Cliff & Morgan, 2015). As early as first grade in school, severe obesity is a psychosocial risk factor with children who are obese being actively rejected by their peers

and are more likely to show signs of depression and mental health conditions (Harrist et al., 2016).

#### *Economic consequences of chronic conditions in children*

As well as physical, psychological and social consequences, health problems associated with excessive weight impose significant economic costs (Colagiuri et al., 2010; Access Economics, 2008). It has been estimated that the annual costs associated with obesity have increased by at least \$50 billion per year since 2008 to \$120 billion in 2013 in Australia (Wakesberg et al., 2013). For every one per cent increase in obesity, the national costs increase by an extra \$4 billion annually (Wakesberg et al., 2013). In Australia, healthcare costs for young children with obesity were 1.62 times more than a child without obesity, as children with extra weight utilised more medical services (Hayes et al., 2016). It follows that protecting children from developing obesity has many benefits at the societal level by reducing health costs.

#### *Perpetuation of inequities in children*

A negative consequence of childhood diet-related chronic conditions is that it affects those most disadvantaged and increases inequities in health (Wake et al., 2012; Brescoll, Kersh & Brownall, 2008; Adler & Stewart, 2009; Skinnert et al., 2018; Laws et al., 2014). Groups particularly affected by obesity in Australia are children living in areas of low social advantage and Indigenous children. Children living in areas of greatest relative disadvantage had more than twice the rate of obesity and overweight than children in areas of lowest relative disadvantage (ABS, 1996; DoHA, 2008; ABS, 2014). From a customised report using AHS data from the Australian Health Survey 2011/2012 (ABS, 2014), children from the highest socio-economic status (SES) areas were less likely to be overweight or obese (19%) compared to their peers in the lowest SES areas (33%). This disadvantage is reflected in similar trends for NCDs and increased morbidity and mortality relative to SES in adults (Rawshani et al., 2016).

Data from the 2012-2013 ABS Australian Aboriginal and Torres Strait Islander Health Survey and 2011-2012 Australian Health Survey reported 30% of Indigenous children aged 2-14 years being overweight or obese compared with 25% of non-Indigenous children

(AIHW, 2020). However, rates of overweight and obesity within Indigenous children varied according to where they lived. According to Dyer et al., (2017), Indigenous children in very remote areas were less likely to be carrying extra weight compared with Indigenous children living in major cities (22% compared with 36%, respectively). Furthermore, unlike non-Indigenous children, children's BMI was lower in more disadvantaged areas (Thurber, Dobbins, Neeman, Banwell & Banks, 2017).

#### **2.2.4 Preventative public health efforts in children**

Australian Burden of Disease findings attribute 38% of the burden of disease as preventable (AIHW, 2019), with two of the three risk factors causing the most burden of disease being overweight and obesity (8.4% total burden), closely followed by dietary risks (7.3% burden). Overweight and obesity contributed to 45% of the burden from endocrine disorders, more than a third of kidney and urinary diseases and nearly a fifth of coronary vascular diseases (AIHW, 2019). Furthermore, dietary risks were responsible for a third of endocrine disorders and more than two-fifths from coronary vascular diseases (AIHW, 2019). Given the link with NCDs risk factors and diet, it is rationalised that focusing efforts on children to prevent obesity, promote a healthy weight and establish lifelong healthy eating habits would be beneficial at the population level physically, socially, psychologically and economically (WHO, 2017; WHO, 2016).

### **2.3 Public health response**

#### **2.3.1 National public health policy**

At the federal level of government, childhood obesity is considered to have reached alarming proportions and poses a pressing challenge with the potential to negate health gains such as increased life expectancy (WHO, 2016). National policies developed to address healthy eating and physical activity in children are listed in Table 2-1 and align with overarching international public health policies (WHO, 2009; WHO, 2012; WHO, 2017). Policies developed through the two levels of government in Australia (federal and state or territory), were supported with significant program investments between 1983 and 1993, and 2005 and 2014 (Wutzke et al., 2018). Initially covering 2008 to 2014, and in some states extended to 2018, the single largest investment in preventing NCD related risk factors in

Australia's history was nearly 1 billion dollars supporting the National Partnership Agreement on Preventative Health (NPAPH, 2008). This included significant funding to prevent obesity and support healthy lifestyle behaviours in children.

**Table 2-1:** National policy examples with the potential to influence healthy eating in children (adapted from Wutzke, Morrice, Benton, Milat, Russell & Wilson, 2018).

Year	Policy or strategy document
1986	Better Health Commission. Looking Forward to Better Health. Vols 1, 2, 3
1988	1988 Health for All Australians
1993	1993 Goals and Targets for Australia's Health in the Year 2000 and Beyond
1997	1997 Acting on Australia's weight: strategic plan for prevention of overweight and obesity
2001	2001 Eat Well Australia: An Agenda for action in public health nutrition 2000-2010
2003	2003 Healthy Weight 2008 – Australia's Future: The National Action Agenda for Children and Young people and their Families
2006	2006 Healthy Weight for Adults and Older Australians. A national action agenda to address overweight and obesity in adults and older Australians 2006-2010
2008	2008 National Preventive Health Taskforce. Australia: The healthiest country by 2020. A discussion paper
2009	2009 Weighing it up: Obesity in Australia. House of Representatives Standing Committee on Health and Ageing inquiry report
2009	2009 National Preventive Health Taskforce. Australia: The healthiest country by 2020. National Preventive Health Strategy – Overview
2010	2010 Commonwealth of Australia. Taking preventative action – a response to Australia: the healthiest country by 2020
2011	Participation in the UN General Assembly (UNGA) and adoption of the Political Declaration on the Prevention and Control of Non-communicable Diseases
2013	2013 WHO Global Monitoring Framework on Non-Communicable Diseases
2013	2013 ANPHA State of Preventive Health

Despite policy support, progress in addressing childhood obesity has been slow and inconsistent across Australia (Wutzke et al., 2018). Notably, current national public health policy supporting healthy lifestyle behaviours and preventing obesity in children does not exist. Less than five years after the Federal Government had pledged a billion dollars towards obesity prevention, the incoming 2014/2015 Australian Government defunded the body overseeing this work and the associated National Partnership Agreement on Preventive Health programs (Australian Government, 2014). This obesity prevention work ceased after 3.5 years, although some states opted to fund some parts of the affected programs (Wutzke et al., 2018). A philosophy of small government (that is, minimal

government involvement) and cuts to all community services since 2013 left health promotion largely unsupported in Australia (Binns, 2014), particularly those directed at young children and those in South Australia.

### **2.3.2 State public health policy response**

Prior to 2013, and enabled by the National Partnership Agreement on Preventive Health (NPAPH), state and territory government health departments had prioritised obesity prevention and healthy eating in children, particularly as children are considered a vulnerable group and an ideal population group for preventative measures (Department Health & Ageing, 2016; NT Government, 2015; Chronic Disease Prevention Directorate, 2017; State of Victoria, 2019; NSW Ministry of Health, 2013). Following the disinvestment of the NPAPH, with the exception of South Australia, most states and the Northern Territory (NT) continued to support the enactment of their state policies, albeit to a lesser extent. Childcare settings targeted in state policies (Department Health & Ageing, 2016; NT Government, 2015; Chronic Disease Prevention Directorate, 2017; State of Victoria, 2019; NSW Ministry of Health 2013) included policy actions focused on building ECEC workforce capacity through nutrition-related training (NSW Ministry of Health, 2013), or took a whole of population approach supporting the development of healthy policies, health-promoting environments and workforce upskilling, which included childcare settings (Chronic Disease Prevention Directorate, 2017). Specific state policy actions relating to childcare services and nutrition are listed in Table 2-2 reflecting this range of approaches.

**Table 2-2:** Specific state and territory policy actions relating to nutrition and childcare services 2011-2019

<b>State or Territory</b>	<b>Name of Policy (reference)</b>	<b>Policy Action</b>
<b>New South Wales</b> * third state plan released Oct 2019	<i>Healthy Eating and Active Living Strategy: Preventing overweight and obesity in New South Wales 2013-2018</i>  (NSW Ministry of Health, 2013)	\$150 million over seven years for workforce development including training of childcare personnel in nutrition and physical activity p. 24, 34, 47
<b>Northern Territory 2015-2020</b>	<i>Health Nutrition and Physical Activity Strategy 2015–2020</i> (Dept Health, Northern Territory Government, 2015)	Provide education, help with developing healthy eating policy and assist menu planning in childhood centres p. 9, 27
<b>South Australia</b> * most programs ceased December 2013 with a change in federal and state government. The State Public Health Plan 2019-2024 (released early 2020) has childcare absent.	<i>Eat Well Be Active Strategy for South Australia 2011-2016</i>  (Government of South Australia. Department of Health. Public Health and Clinical Systems Division. South Australia, 2011)	Provide workforce development and programs, extend the multi-strategy nutrition incentive scheme for all childcare centres p. 31, 35, 36, 46, 48, 49
<b>Victoria 2019-2023</b>	<i>Victorian Public Health and Wellbeing Plan 2019-2023.</i>  (State of Victoria, 2019)	Place-based approaches include early childhood settings. Accelerating the implementation of healthy food (and drink) supply policies in early childhood services p. 3, 5, 33
<b>Western Australia 2017-2021</b>	<i>Western Australian Health Promotion Strategic Framework 2017–2021</i> (Chronic Disease Prevention Directorate 2017. Department of Health, Western Australia, 2017)	Support childcare settings to develop healthy eating policies (p. 32) which facilitate healthy eating environments; strengthen, support and up-skill relevant parts of the workforce in nutrition (p. 33)

### 2.3.3 Whole-of-government public health response

While all tiers of the Australian government and the health departments in particular have some responsibility for funding and delivering policy actions supporting preventative health, government sectors outside of health are considered to also have a crucial role (Hendriks et al., 2013), including the ECEC sector. In several states’ strategies and plans, ECEC settings continued to be prioritised following the change in federal government in 2013 and the



cessation of the NPAPH (Wutzke et al., 2018). The link between children's health positively impacting academic performance and health-promoting environments enhancing children's positive experiences justified this continual support (State of Victoria, 2019; NSW Ministry of Health 2013). Overall, however, the public health response to supporting children and their nutrition is ad hoc and a national focus or alignment between the tiers of government is absent. In the next section, justification for a focus on nutrition and children in centre-based childcare settings will be further argued.

## **2.4 The ECEC setting and determinants influencing nutrition-related behaviours and food environments**

### **2.4.1 Introduction**

In this section, the rationale for a focus by governments, experts and researchers on nutrition and children in centre-based childcare settings is presented from a review of the literature. Moreover, the determinants influencing healthy eating are described to identify which factors warrant government and researcher interest. This section of the chapter elaborates on how childcare personnel and the childcare environment influence children's developing eating habits including their food preferences. How the determinants in childcare settings influence what, and how, children eat is explained using a framework for change proposed by Hawkes et al., 2015, that describes the childcare setting as made up of four sub-environments: food, social, information and policy.

Before discussing the determinants according to the literature, the ECEC sector and centre-based childcare is reviewed to provide context. This includes a discussion explaining the relevant ECEC policies supporting the enactment of centre-based nutrition-related best practices: the National Quality Standards (NQS), the nutrition-related standard, relevant state-administered regulations and local healthy eating policy (HEP) and includes menu-planning guidelines.

## 2.4.2 An overview of the ECEC sector

### *Societal changes and childcare*

While it is recognised that the home environment and parents are the primary determinants of children's food choices and food preferences (Fildes et al., 2014; Peters et al., 2014), significant societal changes in mothers' workforce participation in Australia over the last 30 years have meant that very young children are influenced by determinants outside of the home. Almost all of Australia's 3.8 million children under 12 years attend early childhood education and care (ECEC) services at some time, with more than half using formal ECEC services as the usual form of care (Productivity Commission, 2018). Formal ECEC services include long day childcare, family day care, occasional care services and some crèches. Long day childcare is also referred to as centre-based childcare and since July 2019 as centre-based day care by the federal government. Informal childcare includes care by grandparents, family, friends and nannies (Productivity Commission, 2018). Depending upon the state or territory, children aged four years also attend a preschool program in the childcare service or a dedicated preschool (kindergarten), or both (Productivity Commission, 2015).

### *South Australia's use of centre-based childcare services*

Centre-based childcare is typically purpose built for children aged six weeks to six years, with most children starting compulsory schooling in SA at five years of age. In Australia, centre-based childcare can be operated and owned by government, community and private providers, and is managed through the states and territories. In 2019, 1,399,440 children attended centre-based childcare in 8,056 centres across Australia (Department Education, Skills & Employment, 2019). These services were used by 1,000,740 families and make up nearly 62% of all ECEC services (Department Education, Skills & Employment, 2019). In SA, nearly 45,970 children from 38,400 families used 430 centres (Department Education, Skills & Employment, 2019). Of the 430 centres in SA, 47 are Children Centres managed by the government. These centres are co-located on a campus with other health, school and family services. Of the other 377 centres, approximately 40% are private providers (personal communication, Health Standards Board 2018), and the rest are not-for-profit community services managed by childcare and community members. Most private providers are social

enterprises, and in SA, are typically GoodStart, G8 or Stepping Stones. These enterprises are listed on the stock exchange with Good Start and Stepping Stones a consortium of charities which became private, social enterprises (see glossary).

Childcare settings are important given that children can spend between 4 and 11 hours each day at formal childcare five days a week (Productivity Commission, 2015) where they potentially receive more than two thirds of their daily food intake (Matwiejczyk, McWhinnie & Colmer, 2007) when food preferences are forming for life. Over the last three decades several high-income countries have experienced the same societal change as Australia. Today's generation of children in OECD countries is the first to spend most of their time in some form of childcare rather than in the family home (Adamson, 2008). This phenomenon is corroborated by the latest figures from the OECD with nearly 90% of preschool aged children enrolled in ECEC services in half of the 42 OECD countries and the trend increasing (OECD, 2019).

#### *Rise of non-parental care and mothers' workforce participation*

Increasingly, women join the workforce after the birth of their children, with workforce participation in mothers with children under 15 years old increasing to 67% compared to 76% - of the percentage of all working women aged 25-54. This is up from 50% reported in 1978 (Productivity Commission 2015). Of the working mothers, most paid employment is part time (58%) with 42% full time (Productivity Commission, 2015). In Australia about eight out of ten women aged 25-54 work (compared to nine out of 10 men), and seven out of 10 mothers with children less than 15 years old, have paid employment Figure 2-1: Use of centre-based childcare services and workforce participation percentages for mothers in Australia). This phenomenon over the last three decades has resulted in the creation of a formal childcare industry worth \$9 billion annually in Australian, State and Territory recurrent and capital expenditure (Productivity Commission, 2018), and revenue of \$12.8 billion in the year to June 2017 (Bankwest, 2018). The rising number of parents using childcare contributed to economic growth of 12% and employment growth to 8.1% in the childcare sector in the year to June 2017 (Bankwest, 2018). According to an industry review, 38% of childcare services were not-for-profit, 5% privately owned and 57% either listed on

the Australian Stock Exchange or part of the Australian Real Estate Investment Trust (Colliers International, 2016), reflecting the increasing value of this expanding industry.

Higher employment-to-population ratios, due to the increased number of women entering the labour market, is reflected in better economic prosperity, positive labour-market outcomes, and a focus on ECEC services as conduits for children's development, wellness and education (OECD, 2019). This has prompted policymakers, and governments, to increase the quality and accessibility of formal childcare services to enable greater workforce participation by parents, improve work-life-balance, and make it possible for caregivers to combine work with family responsibilities (OECD, 2019). As such, the phenomena we see of a significant proportion of very young children spending significant amounts of time in formal childcare during an influential development age is now a permanent feature of our culture. Given the hours that children spend in non-parental care, it is reasonable to purport that formal childcare is an influential setting for shaping children's lifelong lifestyle related behaviours. This makes centre-based childcare an ideal setting for embedding nutrition-related interventions and practices, partly because of its considerable reach.



**Figure 2-1:** The proportion of children attending centre-based childcare by age in South Australia and workforce participation percentages for mothers in Australia (Developed from information from Commonwealth of Australia, 2013; Department Education, Skills & Employment, 2019).

### Childcare reach

The potential reach of formal childcare settings is extensive (Department of Education & Training, 2018). Of the almost 800,000 children in centre-based childcare, just over a third of children spend 20-29 hours per week in centre-based childcare and 44% between 30-50 hours per week (Department of Education & Training, 2018).

The number of hours children spend in formal childcare varies depending upon the age of the child, the number of children in a family, and the family composition. In reality, parents use a combination of childcare types depending upon a number of factors. At any one time, 40% of childcare is parent only. The rest is formal childcare or unregulated childcare by relatives including grandparents, neighbours, nannies and au pairs (Productivity Commission, 2015). When children are very young (birth-1-year-old) they are likely to be cared for by parents or informal care provided by grandparents (Australian Institute of Family Studies 2013; Commonwealth of Australia, 2013). From the 2013 Longitudinal Study of Australian Children with increasing age up to school-aged, formal childcare is preferred for pre-schoolers, with 20% of children aged 1-2 years attending formal childcare compared to 58% of children aged 2-3 years (Commonwealth of Australia, 2013). In SA, 93% of children aged 4-5 years attend childcare when the definition of formal childcare includes pre-schools, also known as kindergartens (Commonwealth of Australia, 2013). Although it is difficult to accurately state how many children are attending centre-based childcare, the fact is that many children spend significant amounts of time in care during an influential developmental time.

Overall, the majority of mothers with young children participate in the workforce particularly when their children are more than a year old. During the preschool years, children are cared for using a mixture of childcare types, informal and formal. However, it is predominately centre-based childcare for children aged 2-5 years. This situation means that where once the family home was key, the childcare setting outside of the home is crucial in influencing preschool aged children's developing food preferences and dietary intake patterns. How the childcare environment and practices influence children's food preferences and nutrition-related behaviours is discussed following an overview of the ECEC sector and centre-based childcare structure and governance.

### **2.4.3 A review of the ECEC sector and centre-based childcare**

#### *Governance, regulatory framework and quality assurance*

In 2012 a national system initiated through the Council of Australian Governments replaced state and territory licensing and quality assurance processes (ACECQA, 2017). The National

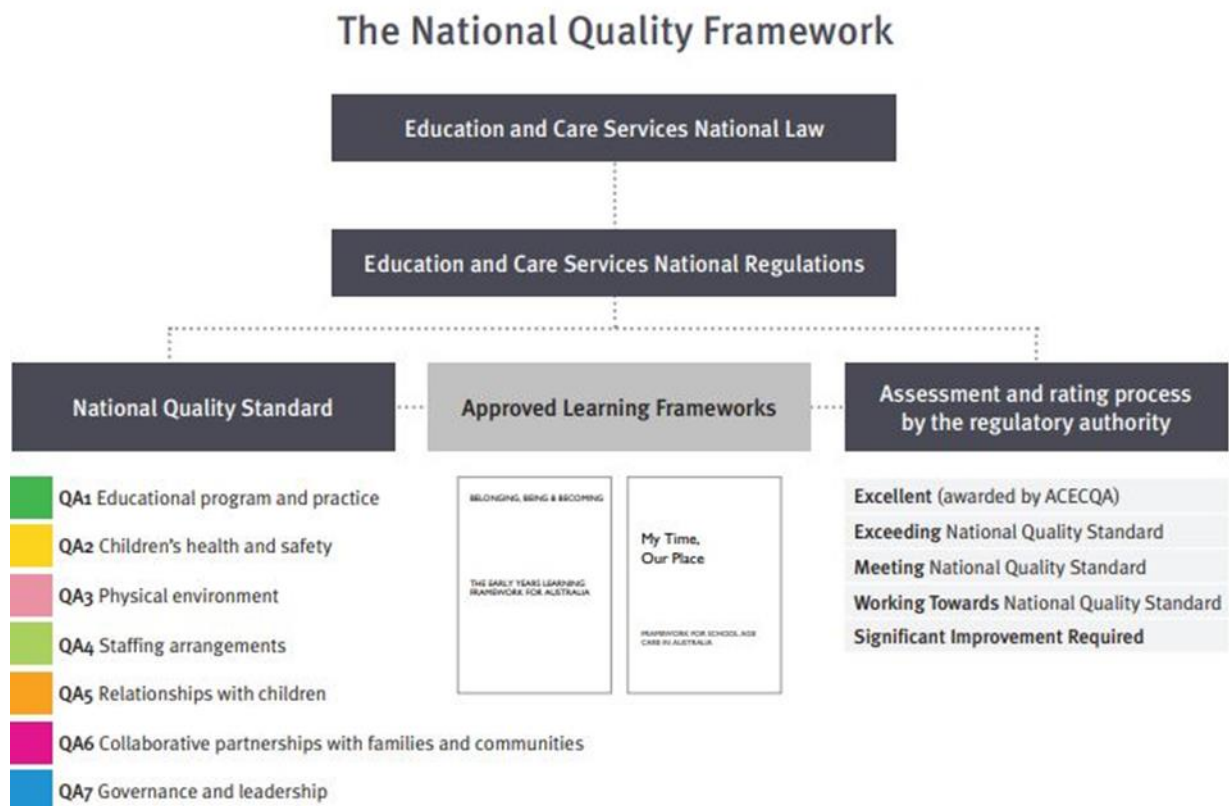
Quality Framework for Early Childhood Education and Care (National Quality Framework or NQF) drives quality through: the National Quality Standards for ECEC and School Aged Care (National Quality Standard or NQS); a national quality rating and assessment process; regulatory arrangements through the state or territory; and a national body to oversee the system which is managed by the federal and state and territory governments (ACECQA, 2017). The Australian Children’s Education and Care Quality Authority (ACECQA) is the national overseeing body that manages and administers the system.

Underpinning the National Quality Framework is the Education and Care Services National Law (National Law) and the Education and Care Services National Regulations (National Regulations). These are legislated, and together they set the National Quality Standard and the regulatory framework for centre-based childcare. These directional policies and their relationship to each other are depicted in Figure 2-2. The National Quality Framework is guided by the values and objectives of the National Law (ACECQA, 2017), and these principles are applied to the operational decision-making of education and care services. These principles influence ECEC policy, guidelines and practices significantly, including nutrition-related practices, and are as follows (ACECQA, 2018):

- The rights and best interests of the child are paramount
- Children are successful, competent and capable learners
- Equity, inclusion and diversity underpin the framework
- Australia’s Aboriginal and Torres Strait Islanders cultures are valued
- The role of parents and families is respected and supported
- Best practice is expected in the provision of education and care services.

The introduction of the NQF in 2012 represented a transformational change in the purpose and delivery of non-parental care in Australia. In the past, the focus was on care, but an awareness of the sectors’ obligations according to the UNCRC, and a review of what practices and services were best for children by the OECD, informed a radical change. The focus of formal childcare extended to include education from birth to five years, when

compulsory schooling started. Moreover, the link with supporting children’s physical health to enhance their learning and wellbeing was made (Department Education & Training 2009).



**Figure 2-2:** The National Quality Framework and directional policies for centre-based childcare services (ACECQA, 2018. Retrieved from [https://www.acecqa.gov.au/sites/default/files/2020-01/Guide-to-the-NQF\\_2.pdf](https://www.acecqa.gov.au/sites/default/files/2020-01/Guide-to-the-NQF_2.pdf) p.9. Reproduced with permission from [ACECQA](https://www.acecqa.gov.au))

### *National Quality Standards*

Underpinned by the principles of the National Law and the legislated National Regulations, the National Quality Standards provides the national benchmarks for quality and are made up of seven Quality Areas (QA) that support positive outcomes in children (Fig. 2-2). Each quality area contains two or three standards which are outcome statements. Each of the standards also has several elements that describe the outcomes that are expected when the standards are operationalised. Supporting each of the 18 standards and 58 elements are a series of reflective questions which describes how the element might be applied and how it might be assessed (ACECQA, 2017), including a standard and element related to nutrition,



(QA2 Std 2.1.3). This element is discussed further in this chapter (section 2.5.4; the childcare and the policy environment) and a list of national standards and elements (ACECQA 2018) is included in Appendix 1.

### *National quality rating and assessment process*

Centres are assessed and rated against the National Standard and this process is undertaken by the relevant regulatory authority in each state or territory. The five rating levels are listed in Figure 2-3. Lastly, the National Quality Standards are linked to the national learning framework for pre-schoolers. *Belonging, Being and Becoming: The Early Years Learning Framework for Australia* (Early Years Framework or EYLF) provides the principles, practices and outcomes needed for a quality learning program (Australian Government Department of Education Employment and Workforce Relation, 2009). Collectively the NQS, rating and assessment processes and the national learning frameworks drive continuous improvement, including practices related to good nutrition. The influence of this framework on nutrition in centre-based services will be further elaborated, following a discussion on the determinants of healthy eating in centre-based childcare according to the literature.



**Figure 2-3:** National Quality Areas and criteria for assessment and rating of centre-based childcare services (ACECQA 2018. Retrieved from [https://www.acecqa.gov.au/sites/default/files/2020-01/Guide-to-the-NQF\\_2.pdf](https://www.acecqa.gov.au/sites/default/files/2020-01/Guide-to-the-NQF_2.pdf), p.318). (Reproduced with permission from [ACECQA](https://www.acecqa.gov.au)).

## 2.5 Centre-based childcare as a determinant of healthy eating habits

The observation that children aged 2-5 years are starting to learn and make their own decisions while under the guidance of childcare staff and the influence of the childcare environment on behaviours makes the centre-based childcare setting ideal for promoting health. According to the American Academy of Paediatrics, 2013,

“Parents and caregivers are responsible for providing a variety of nutritious foods, defining the structure and timing of meals, and creating a developmentally appropriate mealtime environment that facilitates eating and social exchange. Children are responsible for participating in choices about food selection and take primary responsibility for determining how much is consumed at each eating occasion” (American Academy of Pediatrics Committee on Nutrition, 2013, cited in Haines et al., 2019).

Implicit in this statement is that what children eat is central to promoting healthy eating habits but also, as importantly, how children eat. Childcare staff has a key role in both of these, and this can be explained using a framework by Hawkes et al., 2015, describing settings as four sub-environments, namely food, social, information and policy.

### 2.5.1 The childcare food environment

The majority of centre-based childcare services in SA provide at least three meals including lunch and two mid meals prepared by a cook from fresh ingredients (Matwiejczyk, McWhinnie & Colmer, 2007). Food availability, food accessibility, eating cues (repeated exposure of foods), and mealtime routines are factors which influence children’s developing healthy food habits.

#### *Food availability*

The food provided at childcare positively influences children’s dietary intake if it is healthy. Bell and Golley (2015) concluded in their systematic review that the strongest evidence to date relates to food provision and the food environment as a determinant of dietary food patterns. Several intervention studies in childcare settings have shown an improvement in children’s dietary intake (D’Onise, Lynch, Sawyer & McDermott, 2010; Larson et al, 2011;

Bell & Golley, 2015) with healthy menu changes across most food groups, particularly fruit and vegetables (Bell & Golley, 2015; McKay & Nigro, 2017). Post intervention improvements to food provision and intake included more fruit, vegetables and grain foods and fewer sweetened beverages. In studies with a comparison group, these changes were also significant to the intervention group (Bell & Golley, 2015). Systematic review findings by Wolfenden, Jones et al., (2016) support this, reporting that multi-component strategies targeting the foods provided, and including implementation support through training, is likely to be effective, thereby concurring with earlier studies (Molloy et al., 2014; Bell, Davies et al., 2015; Gosliner et al., 2010).

Furthermore, studies comparing foods consumed at home, and foods provided by and eaten at childcare, have shown that children consumed less energy and more protective foods while attending childcare (Erinosho, Dixon, Young, Brotman & Hayman, 2013; Robson, Khoury, Kalkwarf, & Copeland, 2015). More energy, fewer fruits and vegetables, and less milk were consumed at home compared to what was provided through the centre (Erinosho et al., 2013; Robson et al., 2015). Sisson et al., (2017) also found that in 16 centres in the USA, children were consuming more servings of fruit and vegetables compared to comparable meals at home, and children consumed more high-fat, high-sugar foods and sugary beverages when at home.

#### *Food access*

Food access affects children's food choices and refers to the ease with which children can reach and consume food (Cullen, Baranowski et al. 2003). Practises such as cutting up fruit (Wyse, Campbell et al., 2011), having water easily accessible at all times, and offering healthy mid-meal snacks are examples of how childcare settings make foods more accessible to children (ACECQA, 2018). Conversely, childcare centres limit access to EDNP discretionary foods, thereby creating a healthy food environment.

#### *Repeated exposure to food*

As well as food availability and access, repeated food exposure affects the development of children's food preferencing for healthy foods. Repeated exposure to health-promoting food at a young age is imperative because of children's propensity for neophobia, and

because liking for a food is a strong determinant of food choice (Johnson, 2016). Foods which are innately not liked are typically healthy foods which are sour or bitter, such as vegetables and some fruits, as well as unfamiliar foods (Birch 1998, Birch & Doub, 2014; Fildes et al., 2014; Johnson, 2016). For children to develop a food preference for a wide variety of food types, studies support the need for educators to expose children repeatedly to unfamiliar foods at an early age (Ahern, Caton et al., 2019). Through familiarisation children develop a liking for foods and then a food preference (Beauchamp & Mennella, 2009; Nicklaus, 2009; Birch & Doub, 2014). Several studies in childcare settings have demonstrated this as a simple and effective technique for influencing children's food preferences, particularly for vegetables (de Wild, de Graaf & Jager, 2013; Nekitsing, Blundell-Birtill, Cockroft & Hetherington, 2018; Ahern, Caton, Blundell-Birtill & Hetherington, 2019).

### *Mealtime routines*

Whilst mealtimes are provided for all children attending childcare services, there is a paucity of studies about the influence of mealtime routines on children's behaviours, as well as interactions with educators' and peers around meals. The protective benefits of regular family mealtimes for young children are well known and associated with food acceptance and positive eating behaviours (Caldwell, 2016). Notably, a low frequency of scheduled mealtimes is predictive of low vegetable intake (Sweetman, McGowan, Croker & Cooke, 2011). Studies in childcare services have also shown that routine mealtimes create opportunities for socialisation and children's reciprocal interactions with each other (Os, 2019; Johansson & Berthelsen, 2014; Mortlock, 2015) which promote healthy eating behaviours. Moreover, socialisation with educators including intentional teaching, role modelling and food-related conversations (Os, 2019; Ramsay, Branen, Fletcher, Price, Johnson & Sigman-Grant, 2010), and children being able to express agency by self-selecting foods (Ramsay, Branen, Fletcher & Holyoke, 2010), further promotes healthy eating behaviours. Routine mealtimes offer more than opportunities to eat healthy food with mealtime interactions supporting the emotional, social and language development of young children as well as positive eating behaviours and food preferences (Os, 2019; Johansson & Berthelsen 2014; Mortlock, 2015). Johansson and Berthelsen (2014) stated that in toddler groups, meals should be valued as 'pedagogical events' in which children and childcare

providers share conversations, ideas, knowledge and experiences around food and eating. Indeed, the Scandinavian countries, the 'pedagogical lunch' where educators eat with the children in the classroom is the norm (Lucas, Patterson, Sacks, Billich & Evans, 2017; Osowski, Goranzon & Fjellstrom, 2013).

Furthermore, studies in Norway have demonstrated differences between educators focused on rules, obedience and getting the task done and educators who actively engage with children at mealtimes (Os, 2019; Mortlock, 2015). Childcare is characterised by routines for tasks such as eating, sleeping and toileting. Routines tend to impel some educators to focus on completing day-to-day tasks and rules rather than engagement. A lack of engagement is associated with children also being quiet and disengaged at mealtimes, highlighting the importance of skilled educators for meaningful mealtimes (Os, 2019; Mortlock, 2015).

### *Summary*

Food availability, food accessibility, eating cues such as repeated exposure of foods and mealtime routines, are factors known to influence children's healthy food habits and food preferences. Childcare settings are in a unique position where they can provide a healthy menu, easy accessibility to healthy foods, mealtime routines conducive to positive behaviours and repeated exposure to unfamiliar foods. Repeated exposure, particularly to vegetables, is important given that less than 3% of children aged 4-8 years consume the recommended amounts (NHMRC, 2013; AIHW, 2018). Repeated exposure also facilitates a food preference for unfamiliar foods, with studies suggesting that foods at home are not as healthy as in centres (Robson et al., 2015), and healthy foods could therefore be unfamiliar. Although there is a scarcity of studies exploring the impact of mealtime routines and eating cues in childcare settings, positive dietary outcomes are associated with healthy food provision in childcare.

## 2.5.2 The childcare social environment

Childcare personnel influence children's developing food habits by providing nutritious foods, defining the structure and timing of meals and providing access to foods. A focus on the physical food environment (i.e. what food is provided) is clearly crucial but it is the social environment defined by interpersonal interactions between the caregiver-and-child that is equally influential. 'Eating socialisation' helps develop healthy eating practices, values, beliefs and behaviours that are akin with cultural practices (Haines et al., 2019). Young children receive considerable guidance at the centre which impacts eating behaviours, food preferences and self-regulation (Nicklaus, 2016; Marty, Nicklaus et al., 2018). Childcare staff provide this guidance consistent with Satter's 'division of responsibility', whereby childcare personnel provide direction on what and how food is delivered, and children are responsible for deciding what food is selected and for determining how much food they will consume (Merritt, 2007).

### *Self-regulation and choice*

Children's responsibility for how much is eaten (Merritt, 2007) is premised on the assumption that children can self-regulate their intake. Self-regulation is an inborn as well as a socialised ability to begin and end eating according to internal cues of hunger and satiety (Birch & Deysher, 1985; Hughes & Frazier-Wood, 2016; Monnery-Patris, Rigal et al., 2019). Attributed to maintaining this within children, is a highly regulated system responsive to the energy intake of foods (Hughes & Frazier-Wood 2016). This ability to maintain the body in an energy balance is sensitive and affected by environmental cues and feeding practices (Carnell & Wardle, 2008; Hughes & Frazier-Wood, 2016; Monnery-Patris, Rigal et al., 2019). As children get older, they are exposed to environmental cues such as larger food portions over long periods of time and feeding practices which are not aligned with appetite signals (McCrickerd, 2018). As a result, poor self-regulation manifests itself as children over consume despite satiety cues, resulting in excessive bodyweight (Carnell & Wardle, 2008; Hughes & Frazier-Wood, 2016; McCrickerd, 2018; Monnery-Patris, Rigal et al., 2019). It follows that, if the ability for self-regulation is nurtured and protected, children will develop healthy eating habits and a healthy weight. Birch and Davison (2001) posit that children up to three years of age can self-regulate their food intake in response to internal cues of

hunger and satiety (Birch,1998; Dietz et al., 1998; Birch, 1999). However, by age five, children will respond to external cues from their environment based upon early experiences and routines shaped by caregivers (Birch & Doub, 2014). Hence, childcare personnel have an opportunity to promote eating self-regulation in children from a young age (McCrickerd, 2018). They can empower children to respond to their internal cues of appetite, and childcare providers can manage the wider food environment so children will develop healthy eating habits and a healthy weight, which can then continue into adulthood (Hughes & Frazier-Wood, 2016).

### *Responsive feeding practices*

Positive food practices are associated with self-regulation, healthy eating habits and by extrapolation, a healthy weight (Scaglioni et al., 2011; Ventura & Worobey, 2013; Fildes et al., 2014; Johnson, 2016; Nekitsing et al., 2018; Haines et al.,2019). These practices comprise structural constructs (Vaughn, Ward, Fisher, Faith, Hughes et al., & Power, 2015), where rules and limits guide choices and the provision of food availability, food access and mealtime routines. Also considered to be a positive food practice are models of healthy eating and practice which encourages children to develop independent (autonomous) skills by facilitating food-related decisions (Vaughn et al., 2015). Childcare staff have a positive role in creating opportunities for children to develop autonomous skills while encouraging children by giving non-food rewards, coaching to try 'one bite', giving positive verbal feedback, and allowing children to self-select foods from a range of healthy foods provided (Harnack, Oakes, French et al., 2012; Ward, Bélanger, Donovan & Carrier 2016). These positive practices, coupled with adults modelling healthy food habits, impact on children's developing food behaviours (Cooke et al.,2011; Horne, Greenhalgh et al., 2011; Nekitsingl et al., 2018). Furthermore, associative learning, where an unfamiliar food is paired with positive comments or a reward (Horne et al., 2011; Roe et al., 2013), has shown that children accept the new food more readily on exposure. If this is complemented with 'no-pressure' tasting, young children are even more accepting of unfamiliar foods (Roe et al., 2013; Birch & Anzmann-Frasca 2011; Beauchamp & Mennella, 2009; Birch & Doub, 2014). Responsive feeding practices are very relevant in childcare settings. Undermining positive food practices are coercive behaviours such as food restriction, pressure to eat, food bribes and threats (Clark, Goyder, Bissell, Blank & Peters, 2007; Scaglioni, Arrizza, Secchi & Tedeschi

2011; Ventura and Worobey, 2013; Haines et al., 2019). Coercive food-related behaviours have been associated with negative outcomes such as not being able to self-regulate, disliking healthy food and overconsumption resulting in excessive weight (Mrdjenovic and Levitsky, 2005; Clark et al., 2007; Carnell & Wardle, 2008; McCrickerd, 2018). Consistent across the literature is that coercive behaviours such as overly controlling food practices are associated with high child BMIs (Shloim, Edelson, Martin & Hetherington 2015). As such, coercive food-related behaviours should be avoided (Ventura and Worobey, 2013; Vaughn et al., 2015).

### *Feeding styles*

The other feeding strategy described in the literature and relevant to the childcare setting is feeding styles (Horst & Sleddens, 2017; Shloim et al., 2015; Johnson, 2016). Feeding styles relate to the adult-child interaction in general, such as during mealtimes, whereas feeding practices are specific behaviours or rules caregivers use to manage what, how much, or when children eat (Shloim et al., 2015). Two dimensions are used to classify different feeding styles including how much control caregivers (e.g. parents, child careproviders) exert (demandingness) and how much caregivers respond with acceptance to the child's needs (responsiveness). Demandingness refers to how much the caregiver encourages the child to eat e.g. eat everything on your plate. Responsiveness refers to how the caregivers encourage the child to eat. For example: in a responsive (child-centred way) by presenting the food attractively as child-serves, or in a non-responsive (adult-centred way) by showing disapproval for food pickiness and pressuring the child to eat (Horst & Sleddens, 2017).

Feeding styles influence the development of food preferences, with authoritative feeding styles typically including a choice of foods with clear rules and boundaries. Authoritative feeding favours healthier food preferences in children (Birch & Davison, 2001; Hughes, Power, Fisher, Mueller & Nicklas, 2005; Peters et al., 2014; Clark et al., 2007; Rodenberg et al., 2012), and a healthier BMI (Shliom et al., 2015). Whereas restrictive feeding styles, typical of an authoritarian style, does not give the child the autonomy to determine what foods they would like to consume, when or how much, and has been associated with a higher BMI and increased risk of obesity (Hurley et al., 2011; Vollmer & Mobley, 2013; Shliom et al., 2015). It has been speculated that this is a result of children not responding to



internal cues of hunger and satiety but to external cues from adult-child feeding interactions resulting in overconsumption (Birch & Anzman-Frasca, 2011; Peters et al., 2014).

However, a restrictive feeding style typical of an authoritarian parenting approach is not always associated with high child BMIs (Slomin et al., 2015; Horst & Sleddens, 2017). With older age groups such as youth and older young children (Kim et al., 2015; Berge et al., 2014), an authoritarian style with parent-centric rules has had success with supporting children and weight management.

### *Feeding styles in childcare settings*

Research has typically focused on maternal-child feeding styles. Given the impact of maternal feeding style's on children's weight and eating behaviours, it is important to also understand how childcare providers interact with children during mealtimes. Studies are however sparse for childcare settings and so, it's necessary to examine the research from parents. It seems reasonable to draw upon literature from parents because children spend a considerable amount of time in childcare centres, with care providers acting as loco parents. Ventura and Birch (2008) first noted the association between parenting style, dietary intake and weight status; postulating that an authoritative parenting style protects against children developing obesity (Ventura & Worobey, 2013). In contrast, uninvolved or indulgent parenting styles are consistently associated with an increased risk of obesity (Hurley et al., 2011; Vollmer & Mobley, 2013; Shloim et al., 2015). Hurley et al. (2011) describes how responsive feeding (guidance with recognition of a child's cues for hunger and satiety) further moderates dietary intake and weight status, positively. In contrast, non-responsive feeding (lack of reciprocity between the caregiver and child) is associated with negative dietary intake and weight outcomes.

Feeding styles, where there is excessive caregiver control (pressuring, restrictive eating), or where the child controls the feeding situation (indulgent feeding), also has an impact on children. Typically, indulgent feeding styles result in children with few food demands and limited food preferences for healthy foods but facilitate a preference for EDNP foods (Hughes et al., 2005), and a high child BMI (Slomin et al., 2015). Notably, an overprotective feeding style is similar to authoritative feeding styles but includes a higher use of coercive behaviours such as pressure to eat and pressure to be involved (Horst & Sleddens, 2017).

The effect of an overprotective feeding style is yet to be explored as it is a relatively recent phenomenon.

In reality, healthy eating determinants interact with each other and reflect a complex mix of environmental factors (Shloim et al. 2015; Johnson, 2016). Moreover, feeding styles can be situational and change according to the context. In childcare settings studies have shown staff generally using positive feeding styles by monitoring and encouraging healthy intake in children and allowing children to self-regulate (Elford & Brown, 2014). In a UK study, childcare staff displayed responsive child-feeding styles with high levels of encouragement associated with children trying new foods and low levels of pressure to eat (Elford & Brown, 2014). In other studies, childcare providers' awareness and use of responsive child-feeding practices was mixed (Dev, McBride, Speirs, Blich, & Williams, 2016). It appears that childcare centre characteristics, culture, the child's age, other child characteristics, parental gender, family income and SES, all moderate feeding practices and styles which impact on children's weight (Shloim et al., 2015; Horst & Sledden, 2017). Overall, it is difficult to conclude what practices used by childcare providers in the social environment impact on children because of the paucity of studies. This view correlates with the findings of Stacey et al. (2017) from nine systematic reviews examining the effectiveness of childcare interventions on diet. Evidence supported the positive impact of peer modelling and the involvement of parents, but there was little evidence of other effective practices by childcare providers.

### *Children's characteristics*

Caregiver-child interactions are complex with various feeding strategies being used with the same child over time (Shloim et al., 2015). Notably, feeding styles vary by child BMI z-scores, ethnic group and genders (Huang et al., 2012 cited in Haines et al., 2019, Shloim et al., 2015) with child characteristics influencing careprovider' responses. Tovar et al. (2017) found that children's acceptance of foods, for example, prompted feeding practices from care providers' that encouraged autonomy; but food refusal elicited controlling eating-behaviours (CEB), such as insisting that children eat everything on the plate even when not hungry. Educators who did not see a need for CEB described using role modelling, peer modelling and sensory exploration of food as effective strategies to promote healthy eating and were concerned about the consequences of CEB on children's risk of developing obesity

(Dev et al., 2016). In contrast, those care providers who used CEB were under the misconception that CEB was encouraging and used it because they were fearful of parents' judgement that the child did not have enough to eat (Dev et al., 2016).

Children's interactions with other children are also powerful factors influencing healthy eating habits. Peer-modelling that supports healthy food consumption is considered a strong determinant of children's food choices up to the age of 12 years (Cruwys, Bevelander & Hermans, 2015). When peers, or especially an influential peer, chose a child's non-preferred food, preference for that food increased (Birch 1980; Ward et al., 2016). Gender differences, the child's age and the size of the group also resulted in different outcomes with female peer-models, associated with the acceptance of novel, healthy foods (Hendy & Rudenbusch, 2000; Hendy, 2002), younger children influenced by older children (Birch 1980, Ward et al., 2016), and more healthy foods consumed at snack time in a larger group of nine children compared to groups of three children (Lumeng & Hillard, 2007). When reviewing the literature, it appears that careprovider-child interactions are often viewed top down with childcare providers influencing the child. However, on closer scrutiny, what actually happens is a reciprocal arrangement considering both child-level and care provider-level interactions (Gerards and Kremers, 2015).

### *Summary*

Childcare personnel have an important opportunity to employ positive feeding practices, such as responsive feeding, healthy eating modelling and positive feeding practices that guide children to eat while recognising their internal cues for hunger and satiety (Hurley, Cross & Hughes, 2011; Vollmer & Mobley, 2013; Shloim et al., 2015). These feeding strategies, typical of an authoritative parenting style, have been consistently associated with healthy eating, and are considered protective against obesity (Hurley et al., 2011; Vollmer & Mobley, 2013; Shloim et al., 2015). Early experiences which shape children's patterns of food acceptance and consumption are learnt in the social environment created between the care provider and the child (Nekitsing et al., 2018). Characteristics of the child also influence the practices shaping their healthy eating habits, reflecting a complex interplay of interactions between determinants (Shloim et al., 2015; Dev et al., 2016). In addition to the food and social environment, the information environment is increasingly described as also influencing children's developing dietary patterns.

### 2.5.3 Childcare and the information environment

Emerging evidence from several studies in childcare settings have shown that active, hands on involvement of children as part of the curriculum promoting nutrition is effective with children's preference for healthy foods increasing and neophobia decreasing (Dazeley & Houston-Price, 2015; Alliot et al., 2016; Iaia, Pasini et al., 2017; Coulthard and Sealy, 2017). Involving very young children in cooking, gardening and tasting activities has shown promising results as a strategy to improve children's diet (Alliot et al., 2016). In 2014, Dazely and Houston-Price reported on the first empirical study of a non-taste sensory activity program positively impacting preschool children in centre-based childcare using unfamiliar fruit and vegetables. Further studies have shown that preschool children try more fruit and vegetables following sensory-play with real food (Coulthard and Sealy, 2017), and that preschoolers can distinguish between healthy foods and unhealthy choices when educated at a young age (Sigman-Grant, Byington et al., 2014).

Learning through play is well known in early childhood education, particularly Piagetian theory and Vygotskian theories (Nicolopoulou, 1993; Blake, 2015), but evidence of the impact on young children and nutrition is incipient, without strong evidence (Stacey et al., 2017). Given how developmental theory suggests that the early years determine healthy food habits for life, there is considerable interest in involving children directly to shape their evolving food habits and food preferences through the childcare setting. Involvement with children can include: nutrition programming in the curriculum, intentional teaching activities, and nutrition-related conversations with children particularly at mealtimes. Examples include: programming weekly cooking by the children, the children growing, harvesting and preparing vegetables for cooking, stories about where food comes from and farm excursions (Dazeley & Houston-Price, 2015; Alliot, da Quinta, Chokupermal & Urdaneta, 2016; Coulthard & Sealy, 2017).

Nutrition education involving parents, parental-involvement in nutrition-related activities in the centre and communication of nutrition information between the home and centre setting are also considered part of the information environment. An accumulating body of evidence examined in systematic reviews demonstrates that even minor amounts of

parental engagement through the information environment will positively impact on children's dietary intake and weight (Morris, Skouteris, Edwards & Rutherford 2014; Ling, Robbins et al., 2016; Stacey et al., 2017). However, researchers report that parental engagement bridging the two settings is relatively small or even absent (Morris, Skouteris et al., 2014; Ling, Robbins et al., 2016).

### *Summary*

Behaviours that shape early healthy eating provide a foundation for good habits that are carried through into adulthood as children become older and independent (Skinner et al., 2002; Harris, 2008; Ventura & Worobey, 2013; Nicklaus, 2016). Childcare centres are well positioned to support families and guide children by creating supporting food, social and information environments and employing positive practices. Food environments which provide a variety of healthy foods are known to impact positively on children's diet and healthy food habits (D'Onise et al., 2010; Bell and Golley, 2015). As well as healthy food provision, structural strategies which make healthy food easily accessible (Cullen et al., 2003; Wyse et al., 2011) and encourage child competence through regular mealtimes, modelling of healthy eating and repeated exposure of food (Birch & Doub, 2014; Johnson, 2016; Ahern et al., 2019), all improve dietary intake. Childcare provider interpersonal interactions within the social environment guide and influence children's developing healthy eating habits. These practices and approaches are linked with healthier eating in children and protection from obesity (Hurley et al., 2011; Vollmer & Mobley, 2013; Johnson, 2016; Nekitsing et al., 2018; Haines et al., 2019; Horst and Sleddens, 2017), although the evidence for this in a synthesis of findings from systematic reviews is not convincing (Stacey et al., 2017).

Several studies show that responsive feeding practices and styles, such as avoiding food restriction, coupled with structured practices are associated with healthier dietary intakes in children (Shloim et al., 2015; Johnson, 2016; Nekitsing et al., 2018; Haines et al., 2019). Practices which allow children to self-select foods, encourage children to self-limit their portion sizes, and are based on encouragement and praise, all nurture's a child's ability to regulate their eating in response to satiety and hunger cues. These positive food practices are linked with eating self-regulation, fewer EDNP foods, more vegetables and a better nutrition intake (Allinghaus cited in Haines et al., 2019). Furthermore, emerging literature

supports the premise that intentional, hands-on teaching activities and conversations with children improving their food literacy, also improves dietary outcomes (Dazeley & Houston-Price, 2015; Sigman-Grant et al., 2014; Coulthard et al., 2017).

Enabling a supportive food, social and information environment is policy (Hawkes, et al., 2015). The next section will describe in more detail the relevant ECEC policies which direct practices and shape the environments that foster healthy eating habits in children in centre-based childcare settings.

#### **2.5.4 Childcare and the policy environment**

Education and care settings provide many opportunities through policy for children to experience a range of nutritious food and to learn about healthy food choices from educators and other children. In the ECEC sector, the NQS, as a policy driver, sets a national benchmark for the quality of early education and care and brings together seven key quality areas deemed crucial to outcomes for children (ACECQA, 2018). The standard and element relevant to healthy eating in the NQS is 'Healthy eating and physical activity are promoted and appropriate for each child' (QA 2 Element 2.1.3 Health). There are 58 elements in total that centres strive towards and Table 2-3 lists the key nutrition-related standards, elements and reflective questions that relate to supporting healthy eating habits in children aged two to five years. A more comprehensive list of National Quality Standards and criteria relevant to nutrition is listed in Appendix 1.

**Table 2-3.** Selected nutrition-related standards, elements and selected reflective questions from the National Quality Standards for each of the seven Quality Areas (ACECQA, 2018) \* (Derived from selected text and reproduced with permission from [ACECQA](https://www.acecqa.com.au)).

Concept Quality Area (QA) Standard		Descriptor and Element	Selected Reflective Questions**
QA2		Children’s health and safety <i>Children have the right to experience quality education and care in an environment that safeguards and promotes their health, safety and wellbeing.</i>	
2.1	Health	Each child’s health and physical activity is supported and promoted <b>Healthy eating and physical activity are promoted and appropriate for each child.</b>	How do we seek information from children and families about children’s wellbeing, physical comfort or personal needs, and support children sensitively within the service? How do we keep informed of, and implement, current practices and guidelines from recognised authorities? How do we ensure that all educators are familiar with current guidelines about healthy eating, physical activity, rest and safe sleeping? How do we plan food and beverages to meet the preferences of each child as well as their dietary and nutrition requirements, including during excursions or other special activities? How do we incorporate discussions and activities about healthy eating, physical activity and allergies into children’s everyday experiences so that each child is encouraged to make healthy food and beverage choices?
2.2	Safety	Each child is protected. Plans to effectively manage incidents and emergencies are developed in consultation with relevant authorities, practised and implemented	How do we ensure that all educators understand and implement correct procedures relating to food handling, transportation and storage? How do we keep informed of, and implement, current practices and guidelines from recognised authorities in relation to: allergies and anaphylaxis » food safety and hygiene practices? How do we identify which emergency procedures and specific action plans are required for our service and how often do we practise these? What recognised authorities are consulted in the development of these plans?
QA5		Relationships with children <i>Relationships with children are responsive, respectful and promote children’s sense of security and belonging.</i>	
5.1	Relationships between educators and children	Respectful and equitable relationships are maintained with each child.	How do we deliberately, purposefully and thoughtfully interact with children to support their learning? What strategies and techniques do we use to extend and build on children’s comments and conversations? How do we respond to the distress some children experience when they have to adapt to unfamiliar routines, new people and new places? How do we consider the rights of every child when planning and implementing the program?

		The dignity and rights of every child are maintained	How do we encourage all children to understand their rights and the rights of others? How do our service's policies and procedures support each child's dignity and rights?
QA6		Collaborative partnerships with families and communities <i>Collaborative relationships with families are fundamental to achieving quality outcomes for children, and community partnerships based on active communication, consultation and collaboration are essential.</i>	
6.1	Supportive relationships with families	Respectful relationships with families are developed and maintained and families are supported in their parenting role The expertise, culture, values and beliefs of families are respected and families share in decision-making about their child's learning and wellbeing. Current information is available to families about the service and relevant community services and resources to support parenting and family wellbeing	What role do families play in the service? How can we recognise their contributions? How does the information that families provide to the service contribute to operational decision-making? How does the service establish and maintain meaningful partnerships with all families? How do we communicate our philosophy and educational choices with families? How do we encourage families to contribute to their child's experiences in ways that are meaningful for them? How do we share decision-making with families? What decisions can we make together with families? How do we listen to families and include their perspectives in the educational program? How do we respond when families make requests or express concerns? What strategies are in place for information sharing between families and the service during orientation, settling in and onwards?
6.2	Collaborative partnerships	Collaborative partnerships enhance children's inclusion, learning and wellbeing.	In what ways do we work with schools and other community organisations to support children and families? How effective are these strategies and how can we improve them? How do we access support for children's specific individual requirements and rights? What is happening in our local community that is relevant to our work with children and families? How can we best be involved?

\* Colour coded the same as the National Quality Standard document (ACECQA, 2018) \* \*Selected reflective questions from ACEQA (2018) Guide to National Quality

Framework, updated January 2020



### *Nutrition-related standard (QA2 Std 2.1.3)*

Quality Area (QA) 2 has a focus on children's health and safety and the two standards supporting this QA are critical to delivering quality outcomes for children under the *National Quality Framework* because 'children's health, comfort and wellbeing strongly impact on their learning, confidence and self-growth' (ACECQA, 2018, p.157). The Quality Areas and standards are about how children's learning can be enhanced and good health is seen as a requirement to help achieve this. The philosophical stance of the ECEC sector is reflected in this statement rationalising the standard related to health according to the national accrediting body (ACECQA, 2018);

'healthy eating and physical activity contribute to children's ability to socialise, concentrate, cooperate and learn. Learning about healthy lifestyles, including nutrition and physical fitness, is integral to wellbeing and self-confidence' (Early Years Learning Framework, p. 30; Framework for School Age Care, p. 29).

### *Regulations*

Underpinning the outcome-related standards are jurisdiction regulations which are embedded in National Law. The regulations pertinent to the nutrition-related standard are listed in Table 2-4. Relevant to every State and Territory, including SA, the regulations that apply are;

Regulation 78 Food and beverages

Regulation 79 Service providing food and beverages

Regulation 80 Weekly menu

Briefly, the regulations require centres, by Law, to provide food to children which is nutritious and adequate in quantity to meet children's dietary requirements within the context of the child's cultural, religious and health requirements. Centres are also obligated to provide easily accessible drinking water and to display a weekly menu (if centres provide the food), which accurately describes what is provided.

**Table 2-4.** National Regulations underpinning the National Quality Standard and Element 2.1.3 (promoting healthy eating) and selected assessment criteria for meeting the element (ACECQA, 2018)\*. (Derived from selected text and reproduced with permission from [ACECQA](#)).

Quality Area 2 Children’s health and safety <i>Children have the right to experience quality education &amp; care in an environment that safeguards &amp; promotes their health, safety and wellbeing.</i>					
Standard	Descriptor	Regulation	Assessors observe	Assessors discuss	Assessors sight
2.1.3 Healthy lifestyle	<b>Healthy eating and physical activity are promoted and appropriate for each child.</b>	<p>Section 51(1)(a) Conditions on service approval (safety, health and wellbeing of children)</p> <p>Regulation 78 Food and beverages</p> <p>Regulation 79 Service providing food and beverages</p> <p>Regulation 80 Weekly menu</p>	<p>» engaging children in experiences, conversations and routines that promote relaxed and enjoyable mealtimes and promote healthy, balanced lifestyles</p> <p>» using cooking experiences to further children’s understandings of healthy food and nutrition</p> <p>» following the service’s procedures for the safe storage and heating of food and drink</p> <p>» never using food to reward or punish children</p> <p>» encouraging children to eat healthy food without requiring them to eat food they don’t like or to eat more than they need, including supporting children to recognise when they are hungry or ‘full’</p> <p>» sitting with children and modelling, implementing and reinforcing healthy eating and nutrition practices with children during mealtimes</p> <p>» consulting children about their routines and mealtimes</p>	<p>how the service:</p> <p>» meets the needs of children with special dietary requirements</p> <p>» consults with families and children to learn about children’s individual requirements for food, their likes and dislikes in relation to food and any culturally appropriate food requirements</p>	<p>» service’s health and safety policy, including nutrition, food, drink and dietary requirements</p> <p>» program planning including cooking experiences that promote healthy eating and knowledge of nutrition</p> <p>» the service’s policy on dealing with medical conditions such as anaphylaxis and allergies</p> <p>» written procedures for the safe storage and heating of food and drink</p> <p>» resources for families and children on healthy eating and referrals to further information</p> <p>» written menus (where the service is responsible for providing food) on display, detailing the food provided for children that are consistent with the:</p> <p>» Australian Government guidelines Get Up &amp; Grow: Healthy Eating and Physical Activity for Early Childhood, and/or Australian Dietary Guidelines</p>

\* What assessors observe, discuss and sight, adapted from ACEQA (2018) Guide to National Quality Framework, updated January 2020 p.153-155

To assist centre's, achieve the relevant regulations, standards and elements, a number of reflective questions are proposed (ACECQA, 2018) and these are listed in Table 2-4. The reflective questions assist the centre to: consider what happens at the centre with regards to supporting healthy eating habits and providing food and why; to critically reflect on the effectiveness of the practices and whether they are meeting the needs of the child and resulting in positive outcomes; and to consider how these practices might be changed or improved (ACECQA, 2018).

#### *Local healthy eating policy*

With regards to the element that healthy eating is promoted and appropriate for each child (QA2, Standard 2.1.3) ACECQA recommends that centres align practices and food provision with the national dietary guidelines (NHMRC, 2013) and the Australian Government resource *Get Up & Grow: Healthy Eating and Physical Activity for Early Childhood*, developed specifically for the ECEC sector by nutrition experts (Australian Government Department of Health & Ageing, 2009 (updated 2013)).

As evidence of meeting Regulations 78, 79 and 80 most centres across Australia are required by their regulators to have their own healthy eating policy developed and endorsed by their local management group. Some states, such as Victoria, SA and Tasmania provide a template for developing these policies and all centres develop this with reference to the Australian Dietary Guidelines (NHMRC, 2013).

#### *Menu-planning guidelines*

In SA, to review the adequacy of their menu for quality, quantity and compliance with the Australian Dietary Guidelines (ADGs), guidelines for menu-planning and a checklist for centres (SA Nutrition Childcare Partnership, 2005) were developed and embedded within 80% of centres between 2001 and 2013, as part of a government funded multi-strategy initiative (Matwiejczyk et al., 2007; Golley, Bell et al., 2012). Regulations 78, 79 and 80, and state licensing requirements for approved centres were key in leveraging this. In 2009, centres transitioned towards the newly introduced national accreditation standards which provided an additional lever for centres to implement menu guidelines. In the absence of national guidelines for the provision of food in centre-based childcare, most states and

territories developed their own menu-planning guidelines for their jurisdiction. Availability and access to these guidelines varies across Australia. In Victoria, the ACT and Queensland, the state government and Nutrition Australia have partnered to provide menu planning resources and training. In WA, centres have a choice of services from Nutrition Australia (WA) or from Edith Cowan University (ECU) however current menu planning guidelines are not available. ECU has been funded with state government monies from tobacco taxes to provide menu planning support to centres through *SNAC (Supporting Nutrition for Australian Childcare)*. Similarly, New South Wales (NSW) has a choice of services with *Munch and Move* provided through *Healthy Kids eat well be active* or *FeedAustralia*. 'Healthy Kids eat well' is funded through the Ministry of Health, NSW Department of Education, Office of Sport and the Heart Foundation. Menu planning guidelines used in NSW are those developed for the NSW *Caring for Children* initiative (NSW Ministry of Health, 2014 (updated 2019)). *FeedAustralia* is a national NHMRC funded online initiative, including an online menu planning tool, being rolled out through the University of Newcastle, Hunter New England Population Health and Healthy Australia. Nutrition Australia (Queensland) supports the NT, as well as the Northern Territory Government. In South Australia, menu-planning guidelines have not been updated since SRER was rescinded in 2013 and recently Nutrition Australia (Vic Division) has extended user-pay services to include SA as well as Tasmania. In Tasmania, the long-standing *Move Well Eat Well* initiative provides menu planning support through the Department of Health and Human Services.

The different menu-planning guidelines for services which provide meals and mid-meals made by a designated cook or cooks, are listed in Table 2-5 for each state and territory and were reviewed in 2017 and again in 2019. The various guidelines share a lot in common as they have all been developed by nutrition experts funded by the health departments and derived with reference to the recommended number of serves for the five food groups specified in the Australian Guide to Healthy Eating (AGTHE) and overall diet quality specified in the ADGs (NHMRC 2013). All the menu planning guidelines are based upon centres providing one main meal and two mid-meals per day (for morning tea and afternoon tea) and meeting at least 50% of a child's estimated daily requirements for key nutrients. The most common age range used for recommended serves is 2-3 years, however some jurisdictions have provided a range to account for recommendations for 4-8-year-old

children according to national dietary guidelines (NHMRC 2013). All menu planning guidelines recommend the same minimum number of recommended serves for grains and recommend only plain, tap water and plain milk served as beverages for children aged 2-6 years. The guidelines have their origins in a checklist developed through the NSW governments' Caring for Children initiative (NSW Ministry of Health, 2014 (updated 2019). Each state has adapted the checklist and menu-planning guidelines, tailoring the tools to the needs of their jurisdiction. The most recent iteration of this is *FeedAustralia*, a free, national online menu planning tool which is integrated with the data management system used by each service (Grady et al., 2018; Yoong & Williams, 2015; Yoong et al., 2019 ). Initiated in 2017 with the federal department of health, as yet, it is not widely used in SA.

*Get Up & Grow* resources, developed to support the NQS, underpin the menu planning guidelines for food quality for all jurisdictions and are consistent with the ADGs messages. These nationally available resources however do not provide menu-planning advice (Australian Government Department of Health & Ageing, 2009 (updated 2013).

Inconsistencies in recommended servings for the food groups, except for grains, reflects the different requirements for children of different ages. Recommended average serve sizes are based on recommendations for 2-3 year old children, which is the largest proportion of children who attend centre-based childcare (Department Education, Skills & Employment, 2019). Some guidelines include recommendations for 4-8 year old children as specified in the Australian Guide to Healthy Eating (NHMRC 2013) to account for four-year-old preschoolers who attend childcare before compulsory schooling at aged five or six. Moreover, SA and Victoria include child sized serves, but these equate to the adult sized serves in the AGTHE used by other jurisdictions. Only the guidelines for Queensland allow limited discretionary foods with the other jurisdictions not allowing these foods.

**Table 2-5:** Comparisons between centre-based childcare menu-planning guidelines for each state and territory

State/ Territory	Tool for menu planning	Veg	Fruit	Grains	Dairy	Lean Protein	Discretionary* Foods
		Serves** per day per child					
ACT	Menu Planning in Childcare, ACT Nutrition Support Service <a href="http://actnss.org/assets/Menu-planning-guidelines-and-template.pdf">http://actnss.org/assets/Menu-planning-guidelines-and-template.pdf</a>	1-2	0.5- 0.75	2	0.75- 1	Every day	As per national dietary guidelines***
NSW	FeedAustralia's Online Menu Planning Tool <a href="http://www.healthyaustralia.org/feedaus.html">http://www.healthyaustralia.org/feedaus.html</a>	2	1	2	1	0.75	Nil
	Nutrition Checklist for Menu Planning NSW Govt. Two Week Menu Planning Tool <a href="https://www.healthykids.nsw.gov.au/downloads/file/teacherschildcare/NutritionChecklistforMenuPlanning.pdf">https://www.healthykids.nsw.gov.au/downloads/file/teacherschildcare/NutritionChecklistforMenuPlanning.pdf</a>	2	1	2	1	1	Nil
NT	Long Day Care Menu Planner, NT Govt. <a href="https://digitallibrary.health.nt.gov.au/prodjspu/bitstream/10137/665/1/Child%20Care%20Centre%20Menu%20Planner.pdf">https://digitallibrary.health.nt.gov.au/prodjspu/bitstream/10137/665/1/Child%20Care%20Centre%20Menu%20Planner.pdf</a>	2-2.5	1	2	1	0.5-1	Nil
Qld	Menu Planning In Queensland ECEC Settings foodFoundations, naqnutrition <a href="https://d2ktlgllpgl04o.cloudfront.net/wp-content/uploads/2018/12/18114309/Menu-planning-in-Qld-0.75-1ECEC-settings-brief.pdf">https://d2ktlgllpgl04o.cloudfront.net/wp-content/uploads/2018/12/18114309/Menu-planning-in-Qld-0.75-1ECEC-settings-brief.pdf</a>	1.25- 2.25	0.5- 0.75	2	0.75- 1	0.5-0.75	1 serve per day or less
TAS	Early childhood services menu planning guidelines and self-assessment tool Move Well Eat Well Dept Health & Human Services, Tasmania <a href="https://www.dhhs.tas.gov.au/mwew/early_childhood_services">https://www.dhhs.tas.gov.au/mwew/early_childhood_services</a>	1-2	0.5	2	1	0.5	Nil
VIC	Menu Planning Guidelines for Long Day Care Early Childhood Services Healthy Eating Advisory Service, Nutrition Australia (Vic Division) <a href="http://heas.health.vic.gov.au/early-childhood-services/menu-planning/long-day-care/checklist">http://heas.health.vic.gov.au/early-childhood-services/menu-planning/long-day-care/checklist</a>	1-1.5	1	2	1	0.5	Nil
SA	Start Right Eat Right Menu Planning Checklist (ceased 2013 but still used) Consistent with Menu Planning Guidelines for Long Day Care Early Childhood Services, Victoria	1-1.5	1	2	1	0.5	Nil <sup>+</sup>
WA	No current menu planning guidelines or tools available						

\*Discretionary foods: foods relatively high in total fat, saturated fat, added sugar or added salt and relatively low in micronutrients and dietary fibre (NHMRC 2013)

\*\* Serve sizes are those recommended for children aged 2-3 years, or 4-6 years as per national dietary guidelines, Australian Guide to Healthy Eating (NHMRC 2013)

\*\*\*National dietary guidelines recommend extra serves from the food groups or discretionary foods for children who are more active or taller than their peers, quantities not specified <https://www.eatforhealth.gov.au/food-essentials/how-much-do-we-need-each-day/recommended-number-serves-children-adolescents-and>

<sup>+</sup> Although SA menu planning guidelines do not recommend discretionary foods, ham or similar was allowed once a fortnight or less for flavouring quiche or similar

In summary, all the guidelines are consistent with the ADGs and AGTHE with recommended average serves from each of the food groups. Discrepancies between jurisdictions include:

- Serve sizes (Victoria and SA use 'child serves', most use adult serve sizes as specified in the AGTHE (NHMRC 2013))
- Numbers of serves for four of the five food groups (some use recommendations for 2-3-year-olds, others as a range for 2-3 years and 4-8-year-olds)

The age at which children in childcare are considered to be fully weaned and eating family-style meals and foods is between 2-5 years. The discrepancy in menu planning guidelines between jurisdictions is because the AGTHE contains recommendations for both age groups: 2-3-year-olds and 4-8-year-olds, which do not align with ECEC category of 2-5 years (NHMRC 2013). All the guidelines for food provided onsite by cooks restrict discretionary foods except for Queensland which allows one up to one serve per day. SA allowed one serve of ham or similar for flavouring meals (e.g. quiches) once a fortnight (SA Nutrition Childcare Partnership, 2005), and as such does not contribute significantly to the menu.

#### *Overall summary*

National regulatory standards govern all aspects of health and education in the ECEC sector, including nutrition (ACECQA, 2018; Australian Government Department of Education Employment and Workforce Relations, 2009; Australian Government Department of Health & Ageing, 2009). The National Quality Standard and element supporting the provision and promotion of healthy nutrition in Australian centre-based childcare is Standard 2.1.3 '*Healthy eating is promoted and appropriate for each child*'. Underpinning this is the requirement of centres in each state and territory to demonstrate that they are meeting the legislated regulations for the provision of food, which is nutritious, adequate in quantity, and meets the nutritional, health and cultural needs of the child. To assist centres to meet this standard and associated regulation, reflective questions are provided of what state-based assessors may want to observe in action, discuss and sight for verification (Australian Childrens Education Care Quality Authority, 2018). Centres are referred to the national dietary guidelines (NHMRC, 2013) and Australian Government resources (Australian Government Department of Health & Ageing, 2009 (updated 2013)). In the absence of national menu-planning guidelines, with the exception of the NT, nutrition experts funded by the health departments in each state and territory, have developed their own tools for

centres which have cook-provided meals (Table 2-5). Developed by individual centres, local healthy eating policies that are consistent with the ADGs, sighted by assessors and regulators, steer the implementation of these guidelines. Food provision and nutrition-related practices are not monitored or evaluated but self-assessed through a process managed by state jurisdictions and overseen by the ACECQA.

Centre-based childcare services provide many opportunities for children to develop and learn about healthy eating habits. National regulatory standards and local healthy eating guidelines are policies which enable the centres to provide food, social and information environments that support children to develop lifelong healthy eating behaviours. Researchers concur that there are several determinants influencing children's developing food preferences and food related behaviours in the childcare setting, and these have been discussed in this section of the thesis. Table 2-6 provides a summary of the factors considered in this literature review associated with promoting healthy eating habits in young children in centre-based childcare. They are summarised under the four environments needed to facilitate change posited by Hawkes et al. (2016): food, social, information and policy. Interventions in Australian childcare centres directed at these determinants are briefly examined in the next section, exploring whether these interventions are effective.



**Table 2-6:** Factors associated with promoting healthy eating in young children in centre-based childcare under the four environments (suggested by Hawkes et al., 2016): food, social, information, policy.

Environment type	Factors associated with promoting healthy eating
Food environment	<p>Healthy food is consistent with national dietary guidelines is provided</p> <p>Healthy food is easily assessable e.g.: plain, tap water is always available for drinking, fruit is cut-up</p> <p>Healthy food preferences are reinforced with repeated exposure</p> <p>Mealtimes are routine</p>
Social environment	<p>Routine mealtimes create opportunities for socialisation</p> <p>Mealtimes are positive, pleasant experiences</p> <p>Educators use responsive feeding practices</p> <p>Children eat to appetite and determine how much is eaten</p> <p>Children can self-regulate their eating to internal cues of hunger and satiety</p> <p>Healthy eating is role modelled by educators and other children</p> <p>Coercive feeding behaviours are not used</p> <p>Authoritative feeding styles are favoured</p> <p>Educators use mealtimes as opportunities to educate children</p> <p>Conversations about healthy eating and nutrition are positive and frequent</p>
Information environment	<p>Intentional teaching activities involve children in a range of experiential activities e.g.: cooking, excursions, growing and harvesting vegetables</p> <p>Children learn about food and healthy eating through play-based learning</p> <p>Children’s food literacy is increased with intentional teaching activities, play based learning, nutrition education</p> <p>Parents are involved in nutrition-related activities</p> <p>Parents are engaged through information exchange, family communication</p>
Policy environment*	<p>Healthy eating policy and menu-planning guidelines create the conditions for providing healthy food</p>

\*Regulations which support the policy environment include Regulations 78, 79, 80 (ACECQA, 2018) and National Quality Standard 2.1.3 relating to the provision of healthy nutrition (ACECQA, 2018)

## 2.6 Effectiveness of centre-based childcare nutrition best practices in Australia

### 2.6.1 Introduction

The federal, state and territory governments have invested in nutrition-related interventions directed at centre-based childcare to change the environment and create the conditions needed for healthy eating. Results have been highly variable with most interventions resulting in some positive changes to childcare food provision, policy and

nutrition-related practices (Matwiejczyk et al., 2007; Hardy, King et al., 2010; Tysoe & Wilson, 2010; de Silva-Sanigorski et al., 2010; Bell et al., 2012; Golley et al., 2012; Jones et al., 2014; Yoong et al., 2014; Bell, Davies et al., 2015; Bell, Hendrie et al., 2015; Finch et al., 2015; Jones et al., 2015; Yoong et al., 2016; Jones et al., 2017; Seward et al., 2017). None however report changes in all measured parameters. The effectiveness of multi-strategy interventions, interventions targeting food provision and policy effectiveness in Australia are discussed in the following section.

### **2.6.2 Effectiveness of multi-strategy interventions**

Studies measuring the effectiveness of multiple strategies targeting menus, food provision, policy and educator practices have also had mixed results. In most, but not all, evaluated strategies, studies reported positive changes in intervention centres compared to control centres (de Silva-Sanigorski et al., 2010; Bell et al., 2012; Bell, Davies et al. 2015; Yoong et al., 2016). The exception is a study in SA which reported positive changes in all 16 items surveyed (Golley et al., 2012). Recently, Finch et al. (2019) reported that intensive support for NSW centres failed to make significant changes due to limited follow-up post intervention, low levels of training and low intervention dose. Also, in NSW, earlier findings reported few changes as a result of a multi-strategy intervention and attributed this to high levels of policy and nutrition-related best practices at baseline and other preventative activities in the study area (Jones et al., 2014; Jones et al., 2015).

### **2.6.3 Effectiveness of interventions targeting food provision**

Early research in SA has shown that the nutrition award scheme, Start Right Eat Right (SRER), improves centre-based childcare policies, menus and eating environments (Matwiejczyk et al., 2007; Golley et al., 2012; Bell, Hendrie et al., 2015). Bell and others (2015) found that 80% of 236 centres were fully compliant with the SRER award criteria indicating widespread implementation, and that children's dietary intake was positively influenced for all core food groups, with the exception of vegetables, pre and post SRER. In NSW, a cross-sectional study auditing childcare food services, also reported a high proportion of childcare menus consistent with the recommended serves for dietary core

food groups, except for vegetables (Yoong et al., 2014). None of the 46 centres provided sufficient serves of vegetables and around a third did not provide sufficient serves of grain foods (Yoong et al., 2014). These findings are consistent with research reported later by Seward et al., (2017) where there were significant changes in the number of serves offered in menus for fruit, meat, and dairy (and a decrease in discretionary foods), but not in vegetable or grain serves following a multi-strategy intervention. More recently, study results from a multi-strategy intervention targeting food provision in 25 centres in NSW (Yoong et al., 2019) reported significant increases in children's dietary intake for vegetables, wholegrain cereals and meat. The higher diet quality scores reported in this study show promising results compared to findings from other Australian studies calling for further improvements (Bell, Davies et al. 2015; Jones et al., 2015; Yoong et al., 2016; Cole, Vidgen, & Cleland, 2017).

#### **2.6.4 Effectiveness of policy changes**

A few studies have reported positive changes as a result of enacting policy post-intervention, albeit the impact of policies have mainly been on food provision and menu-planning guidelines (Matwiejczyk et al., 2007; Bell, Davies et al., 2015; Jones et al., 2015). There is a dearth of studies addressing policy and an absence of Australian studies exploring the impact of policy on other determinants of healthy eating. Some studies reported difficulties in implementing food policies (Bell, Davies et al., 2015; Gerritsen, Wall & Morton, 2016), which along with the studies previously mentioned, highlight the challenges with translating evidence-based best practice into daily practices. Other determinants of healthy eating include mealtimes and occasions where educators interact with children around food and nutrition. Whilst mealtimes are provided for most children attending childcare services, there is an absence of Australian studies examining the impact of policy guidelines on educators' nutrition-related practices.

### **2.6.5 Interplay between individual factors and the childcare environment**

In reality, children's eating behaviours and centre nutrition practices are a result of a variety of simultaneously occurring factors and interactions between the individual and the environments they occupy (Sallis, Fisher & Owen, 2008). The socio-ecological perspective presumes that human behaviour is a result of the interaction of environmental factors and individual characteristics (Sallis et al., 2008). The core of this model is that the determinants of behaviour influence not only that behaviour of interest (e.g. diet) but also other behavioural interactions (Spence, 2003 cited in Gubbels et al., 2014). Larson et al. (2011) were the first to review studies which explored environmental determinants of healthy eating in children attending childcare. They concluded that studies either addressed child behaviours (e.g. dietary intake) or the childcare environment. The majority of studies ignored the premise that it is in the reciprocal interactions between both child behaviour and the childcare environment where behavioural determinants have their greatest effects (Gubbels et al., 2014).

### **2.6.6 Interplay between agency and social structure**

Using the example of how families make food choices, Delormier, Frohlich & Potvivi (2009) explicate the reciprocal arrangement between agency (voluntary actions by individuals) and social structures. Giddens' structuration theory acknowledges that social practices, such as making food choices within a family, interplay between agency and social structure. Social structures are 'rules and resources' which people draw upon in their practice of certain behaviours, and this creates the conditions of practice that both constrains and enables behaviours (Delormier et al., 2009). With both models, agency can be considered as the capacity of individuals, such as children and educators, to act. The capacity to act however is constrained by structural influences that are realised through the interplay of agency and structure (Sallis et al., 2008; Delormier et al., 2009). Notably, social structure does not determine individual action, 'it is enacted and reified by people through choices they make during social practices and people, through their social practices, reinforce or possibly change the social structure' (Delormier et al., 2009 p. 218). In this model an underlying

premise is that agency and structure are a reciprocal process, each influencing the other and practice outcomes. Therefore, children's eating behaviours and nutrition practices in childcare settings are a result of a complex interplay of many factors at different levels of influence.

#### *Socio-ecological approach to healthy eating in childcare settings*

Researchers call for a socio-ecological approach in understanding healthy eating behaviours, childcare personnel nutrition-related practices and the structural conditions which support these practices (Larson et al., 2011; Lynch & Bartel, 2012; Gubbels et al., 2014). By offering a way to understand how agency, social structures and the environment enable and constrain nutrition-related practices and behaviours, it is postulated that this perspective could inform the development of nutrition interventions (Delormier et al., 2009; Larson et al., 2011; Lynch & Bartel, 2012).

#### *Summary*

A rapid review of Australian research revealed highly variable results and a paucity of studies, with research mainly undertaken in NSW (Yoong et al., 2014; Bell, Davies et al., 2015; Jones et al., 2015; Finch et al., 2016; Seward et al., 2017; Grady et al., 2018) and older studies in SA (Matwiejczyk et al., 2007; Tysoe & Wilson, 2010; Golley et al., 2012; Bell, Hendrie et al., 2015) and Victoria (de Silva-Sanigorski, Prosser et al., 2010). The potential impact of centre-based childcare on children's diets may be limited given the variability in centres use of best practice for nutrition. A decade ago, Larson's seminal review of childcare studies found that centres did not impact on children's diets (Larson et al., 2011). In contrast, recent systematic reviews report that most interventions resulted in positive dietary outcomes (Ward, Welker et al., 2017; Wolfenden et al., 2016). However, Stacey and others (2017) refute this with only one of nine systematic reviews showing the majority of selected studies having a positive impact and concluded that the effectiveness of diet-related interventions was equivocal (Stacey et al., 2017). When these findings are considered together, it appears that interventions targeted at childcare settings may have a positive impact when researcher led but may not be leveraged enough to change strategies and practices routinely used in centres.

Interventions targeting food provision report that there are positive changes to most food groups on menus except for vegetables, and sometimes, grain foods (Yoong, Skelton et al., 2014; Bell, Hendrie et al., 2015; Seward et al., 2017). Multi-strategy interventions also report significant changes in some areas, but no study has reported positive changes in all measured parameters (Bell et al., 2015; Jones et al., 2015; Yoong et al., 2016), except for one study in SA (Golley, Bell et al., 2012). Policy changes were mainly related to food provision and menu-planning and researchers have queried the difficulties experienced by centres in implementing interventions (Yoong et al., 2016; Jones et al., 2017; Finch et al., 2019). Most of the Australian studies have considered individual determinants of healthy eating with few exploring the interplay between the many individual, social and environmental determinants of healthy eating behaviours.

## **2.7 Summary comment**

Without doubt, the ECEC sector recognises the importance of a child's health, attributing this to facilitating learning (Australian Government Department of Education Employment and Workforce Relations, 2009; Australian Children's Education Care Quality Authority, 2018). At the population level, both the state and federal government agree with the importance of children establishing healthy eating habits and recognise nutrition as a public health focus in young children (Department Health & Ageing, 2016; NT Government, 2015; Chronic Disease Prevention Directorate, 2017; State of Victoria, 2019; NSW Ministry of Health 2013). Governments are motivated to target childcare settings because they have considerable reach and the early years are critical to the establishment of lifelong eating habits. The necessity to prevent obesity and protect the population from NCDs is widely recognised and childhood is an impressionable period in which to intervene.

Nevertheless, the public health policy and ECEC sector response to supporting childhood nutrition has been slow and some would say ineffectual given the poor national diet of children and increasing obesity rates. However, underpinning both the NQS which governs the ECEC sector and public health policy are the rights and entitlements of the child according to the United Nations Children's Rights Charter of which Australia is a signatory. A rights-based approach has been used effectively for improving several population health

issues (Priest, Swinburn, & Waters, 2010; Sigman, 2010). In the next section, children's rights to the provision and promotion of healthy nutrition will be explored and addressed in general and within the ECEC context.

## 2.8 Children's rights to optimal nutrition

### 2.8.1 Introduction

'States Parties recognise the right of the child to the enjoyment of the highest attainable standard of health...and shall pursue full implementation of this right and, in particular shall take appropriate measures: ...to combat disease and malnutrition...through the provision of adequate nutritious foods...' *Convention on the Rights of the Child, art. 24*

According to the United Nations Convention on the Rights of the Child (the Convention or UNCRC), of which Australia is a signatory, young children have the right to healthy food, an environment that facilitates healthy food choices and adults that enable this to happen. What children eat is clearly a public health issue. At the population level, the prevalence of children's poor dietary patterns (AIHW, 2018; Australian Bureau of Statistics, 2015; Australian Institute of Family Studies, 2019) and diet-related health conditions, including obesity, is of paramount public concern (Centre of Population Health, 2016; WHO 2017; WHO,2016). The government recognises that this is a compelling and complex issue requiring a preventative strategy aimed at different levels of influence (Centre of Population Health, 2016). As such, childcare settings are of particular interest because nutrition-related interventions can reach many children and interventions supporting nutrition-related practices and supportive environments facilitate positive dietary outcomes (Bell & Golley, 2015; Mikkelsen, Husby, Skov, & Perez-Cueto, 2014; Ward, Bélanger, Donovan, & Carrier, 2015; Ward, Bélanger, Donovan, & Carrier, 2016; Wolfenden et al., 2016).

Unhealthy eating and obesity are increasingly considered a human rights concern, particularly in children who are reliant on adults. There is growing interest in using a human

rights lens to address malnutrition (both over-nutrition and under-nutrition) and NCDs, as seen in the *WHO Global Action Plan for the Prevention and Control of NCDs* (WHO, 2013) and the *Report of the WHO Commission on Ending Childhood Obesity* (WHO, 2016). Incorporating a rights-based approach has been known to be successful in addressing several population health issues (Handsley, Nehmy, Mehta & Coveney, 2014; Priest, Swinburn, & Waters, 2010; Sigman, 2010; Mikkelsen, Engesveen, Afflerbach, & Barnekow, 2016). Unhealthy food marketing directed at children (Granheim et al., 2017; Handsley et al., 2014; Swinburn, & Waters, 2010), the provision of healthy school meals (Mikkelsen et al., 2016) and childhood obesity (Ferguson et al., 2016; Greenway, 2008; Sigman, 2010) are examples of population health issues solved with a rights-based approach. These examples will be discussed later (Chapter Two, 2.8-2.11; Chapter Six, 6.4; Chapter Seven, 7.10, 7.11; Chapter Eight 8.1). A human rights perspective is considered to be useful as a means of prompting action for food policies and healthy environments, as well as recognising the obligations of governments to implement measures to respect, protect and fulfil the rights to health and adequate and nutritious foods (Granheim, Vandevijvere & Torheim, 2019). This approach has not been applied to the under-explored area of child diet-related health and childcare settings to the best of my knowledge. This section initially explains the UNCRC as a human rights instrument used to fulfil, promote and protect children in general (OCHR, 1989). This section then goes on to explore the application of the UNCRC to centre-based childcare and identify relevant provisions which support healthy nutrition.

### **2.8.2 Children's rights and the United Nations Convention on the Rights of the Child (UNCRC)**

Every person is entitled to the highest attainable standard of health and to live in an environment that supports that right (Hunt et al., 2009). The WHO describes a human rights approach to a health issue as “explicitly..... connected to the framework of international, regional and national human rights norms, principles and standards“ (WHO, 2002, p. 17). These norms, principles and standards have been documented and codified into various treaties or other related documents (Hunt et al., 2009). All human rights treaties outline



these features which have their origins in the morals, ethical values and code of conduct of that society (Hunt et al., 2009). These documents also outline how the specified human rights will be realised and provide a framework for governments to enact environments which support people's rights (Hunt et al., 2009).

In Australia, reference to specific human rights is found in the Constitution. Also, in legislation passed by the Parliaments of the State and Federal governments and in seven international human rights treaties, as we do not have a Bill of Rights (Attorney-General's Department n.d.). The right to health is recognised as a fundamental human right and is articulated in article 12(1) of the International Covenant on Economic Social and Cultural Rights (ICESCR) as 'Every human being is entitled to the enjoyment of the highest attainable standard of health conducive to living a life in dignity' (Attorney-Generals Department, n.d.).

Human rights treaties, such as the ICESCR, are not only international Law but also guide and inform policies and practices that need to be implemented for people to realise their rights (Hunt et al., 2009). Human rights are therefore an effective and powerful means for understanding and responding to health issues raised within a community (Hunt et al., 2009; Tobin 2006; Greenway, 2008; Handsley, Nehmy, Mehta, & Coveney, 2014). The UN Committee on Economic Social and Cultural Rights, however, clarifies that the notion of 'the highest attainable standard of health' does not mean that the State guarantees us good health. Many factors influence good health outside of the State's agency and as such the right to health refers to the 'enjoyment of services and conditions necessary for individuals to realise their highest attainable standard of health' (Office of the United Nations High Commissioner for Human Rights, 2015). These rights thereby promote conditions in which people can lead a healthy life, and extends to the underlying determinants of health, such as food and nutrition (Attorney-General's Department, n.d.).

### **2.8.3 The United Nations Convention on the Rights of the Child**

Children have human rights the same as adults, while also needing special protection due to their vulnerability as dependents and developing human beings (Australian Human Rights Commission, 2015). The Convention defines what these rights are and sets out how these rights can be fulfilled by governments (UNICEF, 2015). As such, the Convention names 54

convention articles (or provisions) which describe children's needs and commits States who have agreed to the Convention to achieving these (Greenway, 2008). The Convention is not domestic Law and like Human Rights is part of legislation passed by the Parliaments. As such, the Convention has a persuasive influence only. This is through Article 4 (OHCHR, 1989) which compels States to implement the Convention in legislation and other administrative measures (Greenway, 2008). As a signatory of the UNCRC since 1990, the Australian government is obligated through international Law to: fulfil its responsibilities as specified and agreed to in the signed document; respect the rights of all children within Australia; protect the rights of all children; cease any violations of the treaty and provide assistance or services to fulfil these obligations (Hunt et al., 2009; Beracochea et al., 2011).

The Convention formally and explicitly outlines the rights of children including the right to healthcare (Australian Human Rights Commission, 2015). The UNCRC's four leading principles are: for children not to be discriminated; for all to act in the child's best interest; for children to have the right for survival and development; and for all to respect the views of the children (Australian Human Rights Commission, 2015). As such, principles and parts of the Convention inform various legislation, policy, service provision and best practices (Australian Human Rights Commission, 2015). Acting in the child's best interest is relevant to supporting children's rights to optimal nutrition and health, and children's best interests are a key part of ECEC directional documents and policy.

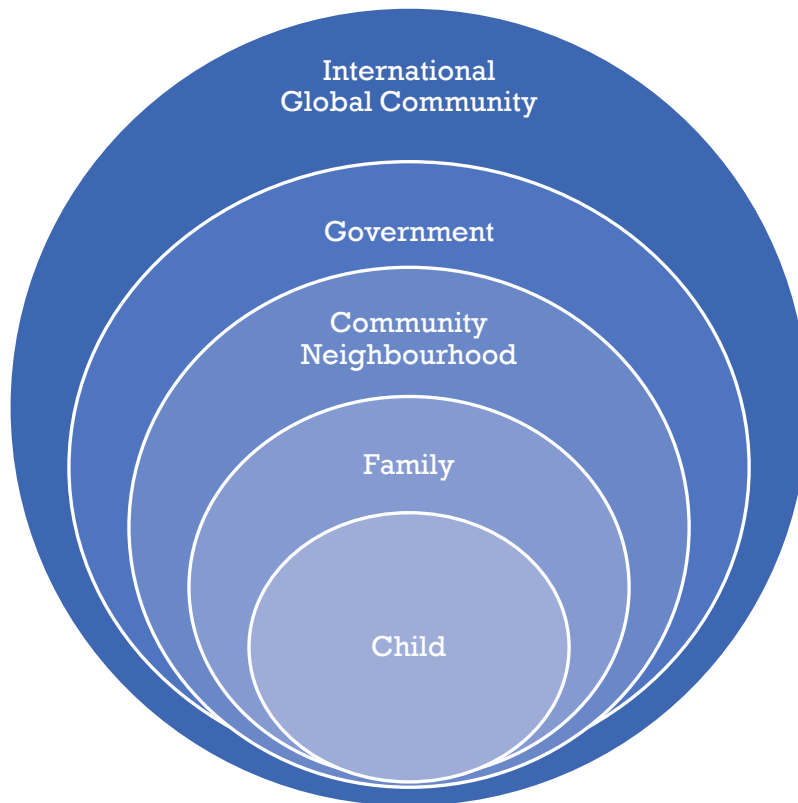
#### **2.8.4 Government responsibility as a duty-bearer**

By agreeing to comply with the UNCRC, the Australian government must prepare a plan for enacting the treaty and consider how laws, policy and practices affect children and their rights. The Convention also assumes that children's rights will be protected from a very early age (Australian Human Rights Commission, 2015). As well as guiding and informing laws, policy, services and practices, human rights treaties, such as the UNCRC, help strengthen the role of the duty-bearer (i.e. the Australian government) so they can fulfil their role while meeting the entitlements of the right-holders, individuals or groups who can claim rights (Hunt et al., 2009; Beracochea et al., 2011). The UNCRC is described by Goldhagen as

'among the most powerful tools available' to address the social, economic and political environments which shape children's wellbeing' (Goldhagen, 2003, p. 742). The Australian Government and other State Parties are obliged to enact the provisions listed in the Convention. With the relevant government ministries, the ECEC sector has specified a position on children's rights through the *Statement of Intent on Children's Rights in Early Childhood Education and Care* (Statement of Intent). Developed by the National Children's Commissioner and Early Childhood Australia, this statement will be discussed later in this chapter.

## 2.9 Children's rights and the responsibility hierarchy

The UNCRC strengthens the role of the duty-bearers in several ways, one of which is the tacit agreement of who is responsible. Kent (1994) outlines a model which describes the obligations and responsibilities of governments to enact the UNCRC as a 'responsibility hierarchy' (Kent, 1994 p. 358). This hierarchy is depicted as a 'nest' with the child in the centre and surrounded by rings of responsibility by family, community, civil society, government and the global community (Kent, 1994 p. 359). Shown in Figure 2-4, the concept is that when a duty-bearer cannot meet its obligations and responsibilities to support and nurture a child, the duty-bearer with the next level of responsibility in the hierarchy is obligated to intervene (Kent, 1994). The duty-bearer is also required to empower and improve the capacity of the duty-bearer below them (Kent, 1994). Hence, if families and the local community struggled to meet the right of the child to health, the government would be obligated to intervene to support the child and empower the families and communities. When considering this and other provisions, the UNCRC can therefore, potentially, be the catalyst to shift the responsibility for a health issue from individuals to entities with more influence over structural determinants, such as governments.



**Figure 2-4:** The ‘Hierarchy of Responsibilities’ depicted as nested rings of responsibility for duty-bearers around the child (developed from Kent, 1994 p.358).

## 2.10 Children’s rights, diet and health

A range of experts have called for the UNCRC to be used as a guide to developing policy and programs to create a healthy food environment and prevent childhood obesity (Greenway, 2008; Priest et al., 2010; Swinburn & Martin, 2010; Swinburn et al., 2008; Ingleby et al., 2008; UN General Assembly, 2011; Handsley et al., 2014). In Australia, international experts used several parts of the UNCRC to develop the *Sydney Principles* (Swinburn et al., 2008). These principles were founded on the obligation of the duty-bearers, mostly government, to protect children from harm and exploitation of food marketing directed at children. Experts have mostly used provisions within the UNCRC to address this issue (Greenway et al., 2008; Handsley et al., 2014; Ingleby et al., 2008; Priest et al., 2010; Swinburn et al., 2008), with the most recent addressing NCDs (Ferguson, Tarantola, Hoffmann, & Gruskin, 2016). In Europe, researchers called for the relevant provisions to be invoked to strengthen the provision of healthy school meals which are legislated for as part of a country’s health policy (Lucas,

Patterson, Sacks, Billich & Evans, 2017). Similarly, Granheim and others have explored the use of a human rights approach to accelerate countries commitment to restricting unhealthy food advertising directed at children (Granheim et al., 2019). This raises the question of whether there is the potential to use the UNCRC provisions to address other concerns, such as the right of the child for optimal nutrition and diet-related health through childcare settings.

### **2.10.1 Children's rights and optimal nutrition**

The relevant overarching standard in a rights-based approach with children is the 'right for the highest attainable standard of health' embedded in article 24.1 of the UNCRC (Tobin, 2006). Article 24.2 (paragraph c) recognises the 'need to provide'...'through adequate nutritious foods', thereby acknowledging the right of a child to nutritious and adequate food as an integral part of a child rights to health (OHCHR, 1989). The right to food was first acknowledged in the Universal Declaration of Human Rights (UN, 1948) as free from hunger, food insecurity and malnutrition (Ziegler, 2012). In the UNCRC it is broader than this and states:

2. States Parties recognise the right of the children to the enjoyment of the highest attainable standard of health...and shall pursue full implementation of this right and, in particular, shall take appropriate measures:

(c) To combat disease and malnutrition...through the provision of adequate nutritious foods... (UNCRC art.24).

State Parties are obliged to 'take appropriate measures' to 'combat disease and malnutrition' encompassing over-nourishment and under-nourishment as well as poor diets in general. In 2014 the UN Special Rapporteur on the Right of Health extended malnutrition to include overweight, obesity and NCDs (UN General Assembly, 2014a) and recommended States address structural changes to food environments as an impediment to enjoyment of nutrition-related rights (UN General Assembly, 2014b). Furthermore, the *Rome Declaration on Nutrition*, adopted at the Second International Conference on Nutrition acknowledged the definition of malnutrition as including overweight and obesity (FAO, 2014, p. 1).

Since then, children's entitlement to support and intervention has been further explored by subsequent scholars with regards to preventing childhood obesity (Greenway, 2008; Ingleby, Prosser, & Waters, 2008; Priest et al., 2010). They purport that the UNCRC and article 24 stipulates the essential conditions needed for children to achieve optimal health and wellbeing. Rights holders are those who can claim rights described in the UNCRC (Beracochea et al., 2011; Hunt et al., 2009), such as children in childcare and parents (who are also rights holders as they are the primary carers). In comparison, duty-bearers are those with particular obligations or responsibilities to enable rights holders to realise those rights (UNICEF, 2015 p.1), such as educators in childcare services.

As part of a rights-based approach to children's health, the importance of the family is not diminished but promoted. Although, it is a matter of the family and for parents to execute children's rights to the highest attainable standard of health they need support to create the conditions which enable this (Brownell et al., 2010; Greenway, 2008; Handsley et al., 2014; Ingleby et al., 2008; Purcell, 2010).

### **2.10.2 Children's rights to a healthy food environment**

Realising children's rights includes providing health-promoting environments that support healthy foods as the preferred choice (Doek, 2010; Sigman, 2010). In a report to the Human Rights Council, the former Special Rapporteur labelled overweight and obesity as a human rights issue that had resulted from obesogenic environments and food systems that encouraged overconsumption and constrained healthy food choices (United Nations General Assembly, 2014a, 2014b). He and others endorsed the development of the *Global Convention for the Protection and Promotion of Healthy Diets* (Consumers International & World Obesity Federation, 2014) which called on governments to introduce public health measures to create supportive and healthy food environments (Vandevijvere, 2014). Prompted by the 10<sup>th</sup> anniversary of the *WHO Global Strategy on Diet, Physical Activity and Health* (WHO, 2004) the Consumers International and the World Obesity Federation recommended an agreed framework of policies, monitoring systems and an international agreement to strengthen government action through policies including regulation and

legislation to address diet-related diseases (Vandevijvere, 2014). The *Global Convention for the Protection and Promotion of Healthy Diets* (Consumers International & World Obesity Federation, 2014) states in Part II, Article 3:

The objective of this Convention and its protocols is to protect current and future generations from avoidable, diet-related ill health by providing a health-promoting food environment through a framework of dietary protection and promotion measures, to be implemented by the Parties at the national, regional and international levels in order to reduce continually and substantially the prevalence of diet-related disease (Part II Art.3 p.8.).

The issue of food marketing directed at children is an example of using the UNCRC to advocate for changes to conditions. Following global consultation, the International Obesity Task Force used the UNCRC as a framework to develop seven principles founded on the obligation of governments to protect children from harm and exploitation through food marketing (Swinburn et al. 2008). Ingleby et al. (2008) and Handsley et al. (2014) progressed this issue further with Handsley and colleagues evaluating the advertising regulations in six countries against the principles of the Convention. They lobbied that governments had an obligation to realise children's rights on the premise that it would decrease the risk of childhood obesity. As such, Handsley et al. (2014) proposed a model of co-operation between the State and parents, where the parents executed the rights of the child with support from government regulation.

Sigman (2010) also contends that children need special protection from obesogenic environments because they are a vulnerable population group whose health is dependent upon the environmental conditions provided by others. Many public health experts share the recommendations for modifying food environments, regulating food advertising and developing government programs which protect children. Furthermore, they advocate for the UNCRC to be used to guide policy development to create healthy food environments (Greenway et al., 2008; Ingleby et al., 2008; Priest, 2010; Reading et al., 2008; Sigman, 2010; Swinburn et al., 2008; United Nations General Assembly, 2011). By invoking relevant provisions within the UNCRC, public health advocates have mobilised actions to create supporting policies and environments.

### 2.10.3 Children's rights to healthy nutrition and acting in a child's best interest

Considering children's best interests is a key principle of UNCRC. It is further stated in Article 3 mentioned previously, but in Part 1, that

'3 (1) In all actions concerning children, whether undertaken by public or private social welfare institutions, courts of Law, administrative authorities or legislative bodies, the best interest of the child shall be a primary consideration'.

This principle, that the best interest of the child shall be a primary consideration' (Art.3.1) guides decision and policy making in all affairs related to children (Logan, 2008). Providing children with food that is inconsistent with evidence-based national nutrition guidelines is not upholding the best interests for the child purported by the UNCRC. Proponents of a rights-based approach concerned about food advertising directed at children argue that parents are responsible for the execution of children's rights but need support from the State (Handsley et al., 2014; Ingleby et al., 2008; Priest et al., 2010; Purcell, 2010; Sigman, 2010). Environmental factors and social determinants are beyond an individual's agency, and hence, involvement from the State is needed to create healthy food environments, through policy, regulations and programs.

The UNCRC recognises the need for an enabling environment by dictating that parents, governments, industry and all relevant others have a collective responsibility to ensure that children's rights and entitlements to health and healthful behaviours are upheld (Purcell 2010; Greenway, 2008). Although the UNCRC does not single out non-parental childcare as responsible, provisions however state that signatories of the UNCRC 'shall take appropriate measures to assist parents and others responsible for the child' (Art.3.3) and that State Parties will ensure 'that the institutions, services and facilities responsible for the care or protection of children shall conform with the standards established by competent authorities, particularly in the areas of safety and health' (Art. 3.3). Moreover, States Parties shall 'render appropriate assistance to parents and legal guardians in the performance of their child-rearing responsibilities and shall ensure the development of institutions, facilities and services for the care of children' (Art. 18.2.2). As such, the ECEC sector has considered its obligations and incorporated the UNCRC provisions within its directional documents.



## 2.11 ECEC policy commitment to children's rights

Three decades ago, the UN developed the UNCRC to guide international thinking about the rights of a child and to influence the laws, policies and practices of signatory countries (OHCHR, 1989). In Australia, key ECEC frameworks and ECEC policies are underpinned by these provisions. This is seen in the national legislative framework for the provision of early childhood services which is made up of several directional policies important to the sector. Both the *Education and Care Services National Law* (the National Law) and the *Education and Care Services National Regulations* (the Regulations) explicitly includes provisions from the Convention. The principles, provisions and articles of the UNCRC embedded within the objectives of the *National Law* (2010) and *Regulations* (2011) are listed in the text box. Furthermore, the Convention is incorporated in the *Early Years Learning Framework, Belonging, Being and Becoming* (EYLF or Early Years Learning Framework) which is the national guide for the curriculum (Australian Government Department of Education Employment and Workforce Relations, 2009).

The principles, conventions and articles of the UNCRC embedded within the *National Law* (2010) and *Regulations* (2011) are that:

- the rights and best interests of the child are paramount (art. 3)
- children are successful, competent and capable learners (Committee on the Rights of the Child 2005, General Comment 7)
- the principles of equity, inclusion and diversity underlie this Law (art. 1)
- Australia's Aboriginal and Torres Strait Islander cultures are valued (art. 30)
- the role of parents and families is respected and supported (art. 5)
- best practice is expected in the provision of education and care services (art. 28).

The commitment to the Convention by the ECEC sector has joined together in a joint position paper with the National Children's Commissioner, Australian Human Rights Commission and the sector's peak body, Early Childhood Australia, as a Statement of Intent for children aged birth to primary school (Australian Human Rights Commission and Early

Childhood Australia 2015). The *Supporting young children's rights: statement of intent 2015-2018*, was developed following consultation within the sector and provided a list of guiding principles and a shared understanding. Proponents also call for action by the sector around children's rights, consistent with article 4 in the Convention where all State Parties should 'undertake all appropriate legislative, administrative, and other measures for the implementation of the rights' and article 42 where State Parties make the Convention well known (Australian Human Rights Commission and Early Childhood Australia 2015).

To date, the daily practices of early childhood educators have been directed by policies underpinned by these UNCRC principles, and through law, regulations and other supporting policies and best practice guidelines. The early childhood sector is expected to enact the provisions listed and provide the conditions and services needed to fulfil children's rights. The articles most relevant to providing and promoting healthy nutrition to children are articles 3, 17 and 24, and the provision most relevant to education is article 28. The relevant conventions of the UNCRC in various ECEC policies are summarised in Table 2-7 and explored more in this chapter. It is by invoking the relevant provisions that public health advocates have mobilised action to address the issue of concern.

**Table 2-7: United Nations Convention on the Rights of the Child (UNCRC) articles relevant to nutrition in centre-based childcare services (OHCHR, 1989) and where the article is referred to in the ECEC policies (ACECQA, 2018) \* OHCHR Convention on the Rights of the Child, Adopted and opened for signature, ratification and accession by General Assembly resolution 44/25 of 20 November 1989 entry into force 2 September 1990, in accordance with article 49**

Descriptor	Article	Article as ratified*	Reference in ECEC policy
States must legislate or use other measures to embed the Convention within directional policies	Art. 4	States Parties shall undertake all appropriate legislative, administrative, and other measures for the implementation of the rights recognized in the present Convention. With regard to economic, social and cultural rights, States Parties shall undertake such measures to the maximum extent of their available resources and, where needed, within the framework of international co-operation.	National Quality Framework National Law National Regulations Early Years Learning Framework National Quality Standard (NQS)
States must make the Convention widely known	Art. 42	States Parties undertake to make the principles and provisions of the Convention widely known, by appropriate and active means, to adults and children alike.	
Decisions are always made with the best interests for the child	Art. 3 (3)	3. States Parties shall ensure that the institutions, services and facilities responsible for the care or protection of children shall conform with the standards established by competent authorities, particularly in the areas of safety, health, in the number and suitability of their staff, as well as competent supervision.	The rights and best interests of the child are paramount (National Law)
Parents and families will be supported and respected	Art. 5	States Parties shall respect the responsibilities, rights and duties of parents or, where applicable, the members of the extended family or community as provided for by local custom, legal guardians or other persons legally responsible for the child, to provide, in a manner consistent with the evolving capacities of the child, appropriate direction and guidance in the exercise by the child of the rights recognized in the present Convention.	NQS Standard 6.1, 6.1.1, 6.1.2, 6.1.3 'Families are supported from enrolment to be involved in the service and contribute to service decisions'; 'The expertise, culture, values, and beliefs of families are respected and families share in decision-making about their child's learning and wellbeing'; The role of parents and families is respected and supported (National Law)
Best practice is expected	Art. 28	States Parties recognize the right of the child to education, and with a view to achieving this right progressively and on the basis of equal opportunity	Best practice is expected in the provision of education and care services (National Law, National Regulations)
Children have the right to the highest attainable standard of health, adequate and nutritious nutrition to prevent malnutrition and disease, access to	Art. 24	1. States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. States Parties shall strive to ensure that no child is deprived of his or her right of access to such health care services. 2. States Parties shall pursue full implementation of this right and, in particular, shall take appropriate measures:	NQS Standard 2.1.3 'Healthy eating and Physical Activity are promoted and appropriate for each child'

preventative health care		(c) To combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking water, taking into consideration the dangers and risks of environmental pollution; (e) To ensure that all segments of society, in particular, parents and children, are informed, have access to education and are supported in the use of basic knowledge of child health and nutrition, the advantages of breastfeeding, hygiene and environmental sanitation and the prevention of accidents; (f) To develop preventive health care, guidance for parents and family planning education and services.	
There is access to information and education about health	Art. 17	States Parties recognize the important function performed by the mass media and shall ensure that the child has access to information and material from a diversity of national and international sources, especially those aimed at the promotion of his or her social, spiritual and moral well-being and physical and mental health.	Quality Area 6: Standard 6.1.3 Current information is available to families about the service and relevant community services and resources to support parenting and family wellbeing. (NQS)
Support for educators is provided	Art. 27 (2) (3) Art. 3 (3) Art. 18 (2)	2. The parent(s) or others responsible for the child have the primary responsibility to secure, within their abilities and financial capacities, the conditions of living necessary for the child's development. 3. States Parties, in accordance with national conditions and within their means, shall take appropriate measures to assist parents and others responsible for the child to implement this right and shall in case of need provide material assistance and support programs, particularly with regard to nutrition, clothing and housing. 3. States Parties shall ensure that the institutions, services and facilities responsible for the care or protection of children shall conform with the standards established by competent authorities, particularly in the areas of safety, health, in the number and suitability of their staff, as well as competent supervision. 2. For the purpose of guaranteeing and promoting the rights set forth in the present Convention, States Parties shall render appropriate assistance to parents and legal guardians in the performance of their child-rearing responsibilities and shall ensure the development of institutions, facilities and services for the care of children	
Children can express themselves	Art. 12 (1)	1. States Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.	Quality Area 5: Standard 5.1.2 The dignity and rights of every child is maintained (National Quality Standard)

## 2.12 Children's rights and nutrition in ECEC settings

When parents leave their children in ECEC settings, they are implicitly handing over the care of their children to the childcare providers. According to the nested hierarchy of responsibility (Kent, 1994) discussed previously, childcare providers become the duty-bearers to help fulfil obligations under the UNCRC. Coupled with the NQF to act in the best interests of the child there are several provisions within the UNCRC that relate to nutrition that childcare providers must support. Given that the majority of very young children spend time in childcare at a crucial time when their immediate and long-term food preferences and dietary intake patterns are being determined, a closer look at the relevant UNCRC provisions directing services and conditions to support these rights of the child is warranted.

### 2.12.1 Child rights to optimal nutrition (art 24.)

Article 24 recognises the right of a child to 'nutritious and adequate food' as an integral part of a child rights to health (OHCHR, 1989). Moreover, in addition to a quality diet, children are entitled to nutrition to 'combat' the development of NCDs and malnutrition, such as obesity. In the National Quality Standards, Quality Area 2: Children's Health and Safety, the NQS highlights the importance of supporting children's health and wellbeing:

'All children have the right to experience quality education and care in an environment that provides for their health and safety. This should be complemented by a focus on promoting each child's wellbeing and providing support for each child's growing competence, confidence and independence.' (ACECQA, 2011, p. 50)

Standard 2.1.3 in Quality Area 2 states that childcare providers are responsible for enacting the outcome 'Healthy eating and physical activity are promoted and appropriate for each child' (ACECQA, 2013) Further supporting this standard are a number of other UNCRC provisions.

### 2.12.2 Child rights to information and education (art 17.)

According to the UNCRC, children are also entitled to information in all its forms, including information and education aimed at a child's promotion of their physical health (art 17 (1)). State Parties, and centre-based childcare services are also obligated to provide education, information and support to children in care and to the parents (as proxies for parents) as per article 24, part e;

Parties recognise the right of the children to the enjoyment of the highest attainable standard of health...and shall pursue full implementation of this right and, in particular, shall take appropriate measures:

(e) To ensure that all segments of society, in particular parents and children, are informed, have access to education and are supported in the use of basic knowledge of child health and nutrition... (art. 24)

This has been reinforced by the International Committee on the Rights of the Child (2013) where health information must be age-appropriate, accessible, and in a form that enables children to make healthy choices (General Comments 15). The *Global Convention for the Protection and Promotion of Healthy Diets* also specifies children as having these rights (Consumer International World Obesity Federation 2014).

It is well recognised that food literacy is important for empowering individuals to make healthy food choices (Velardo, 2015; Vidgen & Gallegos, 2014) and there is increasing evidence that food literacy has an impact on young children's understanding and behaviours related to food (Jarpe-Ratner, Folkens, Sharma, Daro, & Edens, 2016; Sigman-Grant et al., 2014). The importance of children's education and learning underpins key ECEC documents and is explicit in the National Quality Standard, Quality Area 1 encompassing educational programs and practices (ACECQA, 2018, Appendix 1). Although nutrition education is not identified per se, there are the means of doing this through programming and play (Kennedy & Barblett 2010; Finch et al., 2019).

### **2.12.3 Educators providing best practice (art. 28) and supporting the best interests of the child (art 3.).**

Within the national ECEC legislative framework, articles 3, 5 and 28 of the UNCRC explicitly inform the role of professionals and emphasise; acting in the best interests of the child (art. 3), working with families (art. 5), and enacting best practice (art. 28). Best practice refers to ways of working that are put together based on the "best evidence" available from research. The aim of best practices is to 'apply the most effective and relevant interventions, based upon research, to real-life practice' (HCGNE n.d.). Best practice is one of four pillars of the UNCRC (Australian Human Rights Commission 2015) and as such is articulated into actions in the *Early Years Framework* (2009) which guides curriculum development, the *National Quality Standards* which guides quality and best practices, and the *Statement of Intent* which guides educators to support children's rights in their day-to-day practice.

In the Statement of Intent, a key action area relevant to educators identified by the National Children's Commissioner includes Action 1.1 which acknowledges the importance of building educators' capacity to create services and conditions facilitating children's rights;

'building early childhood professionals' capacity, skills and knowledge to work, think and behave in a way that supports the implementation of children's rights'  
(Australian Human Rights Commission, Early Childhood Australia 2015 p.3).

In the UNCRC there are clearly a number of provisions relevant to nutrition. Missing from this review is the presence of the children's voice.

### **2.12.4 Child rights to a voice**

The Statement of Intent acknowledges that children have the right to express their views and be part of decision making for issues that relate to them as part of best practice (AHRC & ECA, 2015 p.3). According to the UNCRC (art. 12) children's participation in decision-making processes, and having the opportunity to voice their concerns, is paramount (AHRC & ECA, 2015). Children's voices were included to a small extent in the development of the Statement of Intent, although not about food. It is questionable how very young children

can participate in decision-making, prompting the caveat in article 12 that 'children should be free to have opinions and those views should be given due weight in accordance with the age and maturity of the child' (UN Office of the High Commissioner for Human Rights, 1997). A limited number of observational studies have explored the children's participation in expressing their needs in centre-based childcare. In Queensland, this issue was investigated with children invited to be co-researchers to define what rights were from their perspective (Harcourt, 2013). By observing and recording the discussions, supported with drawings and child-taken photography, children demonstrated that educators do not hear their 'voice' and those children can participate in decision-making related to everyday needs, such as sleeping arrangements. Children also demonstrated a deep and empathetic understanding of how rights-based issues affect children from other parts of the world. In Sweden, children aged up to three years old were observed exercising their rights each day, in accordance with Article 12, through ownership, influence and equal value (Quennerstegt, 2016). These findings raise questions about the role of children in decision-making and research. A meta-analysis of research between 2009-2012 involving children aged birth to eight years old found that only 3.4% of studies positioned children in participatory roles (Mayne & Hewitt, 2015). Children's rights to express themselves have not filtered through early childhood research with most children being non-participant objects. It is uncertain where children's voices are heard with regards to food and nutrition.

### **2.13 Framework to examine children's rights to the provision and promotion of healthy eating; Child Rights Situation Analysis**

A framework used in research to determine to what extent children's rights are realised is the Child Rights Situation Analysis framework (CRSA). Since the 1990s, when the UNCRC was ratified by countries, several iterations of CRSA guidelines and methodologies have been developed by different organisations which were drawn upon in this thesis (Save the Children, 2014; UNICEF Program Division, 2014; UNICEF Division of Policy and Strategy, 2012). These iterations share a core framework of human rights orientated analysis and process, with differences reflecting the different nature of the agencies or core work areas that the framework has been used to analyse. The CRSA process involves several logical



steps including: an analysis of the existing situation; identifying what the issue is; identifying children's rights which are affected; identifying the barriers and obstacles to the realisation of these rights; an understanding of the roles, actual and potential, of a range of key stakeholders; and an understanding of the capacity of stakeholders to fulfil children's entitlements. The CRSA findings are then used to inform solutions to the gaps. As such, the CRSA can be used to understand the extent to which children's rights are realised in centre-based childcare services and is described in more detail in the Methodology Chapter (Chapter 3).

## **2.14 Summary; is healthy eating in childcare a human right?**

As a signatory of the Convention, State Parties including the Australian governments have an obligation to act in the best interests of the child (art. 3) and use the UNCRC to guide and inform laws, policy, services and practices (art. 4.; art. 42.). There is an obligation to create and promote enabling services and conditions for children to attain their potential for health, including optimal nutrition and the prevention of malnutrition and NCDs (art. 24). The UNCRC strengthens the role of the duty-bearer to enact the provisions of the Convention and supports the recipients of the provisions (Hunt, 2009). In the UNCRC there are a number of provisions that have significant relevance to children fulfilling their entitlements in centre-based childcare to optimal nutrition, including the opportunity to develop healthy eating habits to prevent diet-related NCDs.

According to the nested hierarchy of responsibility (Kent, 1994), childcare providers take responsibility for children entrusted to them by parents. Centres are obliged to create the conditions and services for children to fulfil their right to optimal nutrition and healthy eating environments, according to several articles in the UNCRC (OHCHR 1989). The ECEC sector is committed to children's rights, and this is reflected in the Statement of Intent and other parts of policies that make up the National Quality Framework, including the National Law, the Regulations and the ELYF. Although the UNCRC and the Statement of Intent does not elaborate on how healthy food preferences and dietary patterns will be promoted or provided, article 24, article 3 and article 17 in the UNCRC explicitly sets out the provisions

for the ECEC sector to create the conditions which will facilitate optimal nutrition. Furthermore, childcare providers' capacity to create the opportunities for children to attain optimal nutrition (art. 24), protect children from NCDs and malnutrition (art. 24), and create opportunities for learning about food literacy and nutrition (art. 17) is implied, but not explicit, through the National Quality Standard Quality Area 2.

At the global level there is growing interest in using a human rights lens to address public health concerns to reduce the risk of unhealthy weight gain, and prevent obesity and NCDs (Bellew et al., 2019; Jones, 2017; WHO, 2017; WHO, 2016; McGuire S, 2012; WHO, 2012). The *Global Convention to protect and promote healthy diets in children* (Consumers International & World Obesity Federation, 2015) acknowledges that State Parties like Australia, who are signatories of the UNCRC, are obligated to provide the conditions for every child to attain the highest attainment of health (Consumers International & World Obesity Federation, 2015 p.5). The *Report of the Commission on Ending Childhood Obesity*, charged with reviewing and strengthening gaps in existing mandates, has also affirmed children's rights to health (WHO, 2016 p.8). Furthermore, a focus on childcare settings as a facilitator for promoting healthy food intake and dietary food patterns are recommended actions 1.8, 4.9, 4.10 and 4.13 (World Health Organization, 2017).

The Australian government has an important responsibility to uphold children's rights to optimal nutrition and the conditions that support this as UNCRC signatories. Furthermore, given the significant amount of time children spend in formal childcare during an influential stage of developmental, governments also have a responsibility to support childcare providers to enact the UNCRC provisions.

It appears that healthy eating in non-parental childcare settings can be considered to be a human right given an examination of the UNCRC which identifies a number of nutrition-relevant provisions. Interest in addressing malnutrition and diet-related NCDs is seen in global policies (Centre Population Health, 2016, WHO, 2016a; WHO, 2016b; WHO, 2017) and a commitment to children's rights is recognised in several ECEC documents and laws that make up the NQF. Parents, who as primary carers are also right-holders, delegate responsibility to childcare providers as proxies for the family setting when children are in care. Both childcare personnel and parents share this responsibility but from the literature it

is unclear to what extent centre-based childcare settings offer the services and conditions needed for children to fully realise their entitlements to healthy food provision and supportive environments for developing lifelong, healthy eating habits. Childcare providers are well positioned to create supportive conditions which impact positively on children's nutrition. In the following section, other questions which have formed as a result of this literature review will be identified, leading to the research questions for this thesis.

## **2.15 Research question, aims and objectives**

### **2.15.1 What is known?**

Children are vulnerable because very young children are dependent upon others for their nutrition. Not only are they dependent upon others for their immediate nutritional needs but what others provide and the conditions they create also influences children's food preferences for life. Children are also vulnerable because they do not have a voice and others must advocate for them. The rights and entitlements of children are recognised in the UNCRC of which Australia is a signatory. Article 24 in the UNCRC acknowledges children's rights to be the highest attainment of health, optimal nutrition and protection from dietary related disease, including NCDs. According to the UNCRC, the State and non-state actors (including caregivers and parents), are responsible for promoting and providing healthy nutrition to young children and protecting children from NCDs.

Healthy nutrition is accepted as important for children's short term and long-term health. In Australia, it is a public health concern that children are not meeting national dietary guidelines. Curtailing the increasing prevalence of obesity is also a national public health priority. Childhood obesity is increasing worldwide and is a trend predicting a future with generations of young people burdened with chronic conditions that will compromise their wellbeing. These concerns are exacerbated by evidence that excessive body weight and other risk factors for NCDs have their origins in childhood where dietary food patterns and food preferences are developed at an early age and track into adulthood.

In the last 30 years, significant societal changes have occurred; where once the family home was the primary setting that influenced children's developing food preferences and lifelong food choices, now the childcare setting shares this role. Changes in mothers' workforce participation have resulted in a childcare industry where a significant proportion of children under the age of five receive formal childcare averaging 20 hours or more a week. At centre-based childcare, children can receive up to two-thirds of their daily nutrition, and equally as important, be exposed to protective determinants positively shaping their dietary food patterns and food preferences. Childcare settings are recognised as a strategic area for healthy eating interventions because of their broad reach and potential to impact children's nutrition and health. The potential for childcare settings to positively influence children's healthy eating habits is reflected in global policies (WHO, 2016a; WHO, 2016b; WHO, 2017), national public health plans (McGuire, 2012; Barnes, 2010; Buscermi et al., 2017; Jones et al., 2017), and state and territory public health strategy's (Department Health & Ageing, 2016; NT Government, 2015; Chronic Disease Prevention Directorate, 2017; State of Victoria, 2019; NSW Ministry of Health 2013). Furthermore, the crucial role of ECEC settings in providing and shaping nutrition for children is recognised and the work of care providers supported through the: UNCRC, the Australian Human Rights Commission and Early Childhood Australia Statement of Intent, National Quality Standards and nutrition-related best practices. Federally, the government has funded the development of printed resources to support the NQS standard pertaining to nutrition, and each state and territory has developed its own iteration of menu planning guidelines and supporting resources, all of which are voluntary.

Policy and evidence-based practices shape the different childcare environments (food, social, information) and what childcare providers do. With reference to the socio-ecological model, it is the childcare environments, the home environment and childcare providers' and children's interaction within these that influence their diet and food preferences. Evidence confirms the assertion that ECEC practices, programs and policies can shape and influence children's dietary food patterns and food preferences at an impressionable age.

Pivotal to enacting these policy-actions are the ECEC childcare providers. Parents trust childcare personnel with the care of their children and even a decade ago researchers purported that centre-based childcare settings have replaced the family table as the

environment for children to learn healthy eating habits (Briley & McAllaster 2011). Evidence supports the proposition that ECEC childcare providers are vital in supporting children's developing dietary food patterns and food preferences through food provision (access, availability, mealtime schedules, repeated exposure), socialisation (educators' feeding practices and feeding style, role modelling behaviours, mealtime behaviours, peer modelling), learning (curriculum programming, positive conversations), and policy. The essential role of childcare providers in centre-based childcare in providing, protecting and promoting healthy diets is argued in this thesis as a right of the child as well as a public health priority.

### **2.15.2 What is not fulfilled?**

Governments and the ECEC sector are, however failing children and their families. There is no evidence in the literature, or the statement developed by the Australian Human Rights Commission and Early Childhood Australia of a rights-based approach in ECEC settings within the context of fulfilling Art 24 or Art 3. Despite considerable government investment, children are not meeting national dietary guidelines. Although obesity rates are showing signs of stabilising, absolute numbers of children who are overweight or obese are unacceptably high with increasing rates of children becoming morbidly obese. Children are also consuming more than a third of their dietary intake with discretionary foods before they even start school. Government health policy is ad hoc, with some, but not all states prioritising childcare settings. In the absence of a national preventative health policy or national healthy eating guidelines for ECEC settings, each state and territory has developed their own menu planning guidelines which are inconsistent and voluntary.

Children are entitled to optimal nutrition and the conditions which prevent the development of dietary-related non-communicable diseases through the UNCRC. The Statement of Intent affirms the ECEC sector's commitment to a rights-based approach. According to the hierarchy of responsibility and the UNCRC (Article 18), parents are also entitled to be supported in delegating their role as duty-bearers to centre-based personnel while children are in care. There is no evidence in the literature of the provisions in the UNCRC being enacted as a child's right. There is also no evidence in the literature of childcare providers' understanding or implementing this within the context of nutrition. It is

unknown to what extent childcare providers understand the rights of the child for the provision and promotion of good nutrition to protect the child from NCDs and associated risk factors.

Childcare typically conforms to various regulatory pressures and is guided by policies and similar measures. Policy and nutrition-related practices encouraged through policy create environments which strengthen the ECEC setting to promote healthy eating and facilitate the development of healthy dietary food patterns in children. As such, the Australian government has prioritised the ECEC sector as a health promoting setting in some state and national policies.

### **2.15.3 What are the gaps in knowledge?**

We know that certain interventions and practices work, and we know that they do not work as well when implemented as part of childcare providers' routines and responsibilities.

There is a paucity of Australian studies examining the effectiveness of nutrition interventions or practices in centre-based childcare with variable results. Internationally, there is evidence for the effectiveness of childcare practices to improve food provision and availability but evidence that other nutrition practices known to impact positively on children is less convincing. Moreover, there is limited evidence that pragmatic strategies enacted by staff in ECEC settings are effective, particularly compared to tightly managed research interventions.

A significant limitation of evidence-based, nutrition practice appears to be its translation into day-to-day routines. Key to this is the role of ECEC childcare providers where implementing best practice requires close attention to the interactions between people who make the decisions and the environment in which those decisions are made. There is minimal literature exploring their perspective or experience with implementing evidence-based practices or enacting the rights of the child for optimal nutrition.

By understanding the barriers and drivers for implementing nutrition best practice from the childcare providers' perspective, policymakers, public health experts, the ECEC sector, and researchers can be better informed on what to invest their resources in for success.

Moreover, without these practices being appropriately implemented, children will not benefit from the policies, practices and programs directed at children in childcare settings.

#### **2.15.4 What needs to be examined?**

An understanding of childcare providers' perceptions and experiences using a right-based approach is important for providing insights into; the barriers and facilitators to translating evidence-based practice into everyday routines; the differences between what experts develop from the evidence and the 'lived experience'; and childcare providers as actors supporting children's rights. Nutrition-related interventions and best practice work best if they meet the needs and capitalise on the strengths of the childcare providers with evidence-based strategies that are practicable in the real world (Baronwski et al., 2009; McSweeney, Rapley, Summerbell, Houghton & Adamson, 2016). Without this understanding to inform the development and implementation of tailored interventions or to inform the translation of evidence into day-to-day practices, children will not receive the conditions and services needed to fulfil their nutrition-related rights.

Before a behavioural intervention can be designed and implemented, or best practice embedded into daily routines, it is important to gain an in-depth understanding of childcare providers' insights and experiences. The best way to do this is through qualitative research (Creswell & Poh, 2017). Moreover, in recognition of the complexity of the determinants of healthy eating habits, researchers call for a socio-ecological approach in understanding healthy eating behaviours, nutrition-related practices and the structural conditions which support these practices (Larson et al., 2011; Lynch & Bartel, 2012; Gubbels et al., 2014). An understanding of childcare providers' perceptions and experiences, including the determinants affecting healthy eating in centre-based childcare, would provide insights into the evidence-to-practice gap and how this can be addressed.

#### *Implications of gaining this understanding*

Understanding childcare providers' perceptions and experiences have implications to practice and can be used to: strengthen children's rights to the provision and promotion of good nutrition; build the capacity of childcare providers to support children to achieve their rights to optimal nutrition and health; provide insights into childcare environments and their

effect using a socio-ecological approach, and contribute to the limited research in childcare on the translation of evidence-based practices into day-to-day routines. An understanding of this can inform and strengthen current policy and practices, position childcare providers as significant contributors and lead to designing effective nutrition-related interventions and other supportive strategies. Outcomes may also have universal application to strengthening evidence-based nutrition practices and a rights-based approach to other forms of childcare i.e. childcare provided by grandparents, or similar childcare settings internationally, or to settings with similar influencers e.g. aged care facilities. Moreover, centre-based childcare appears to be the ideal setting for children to fulfil their rights for optimal nutrition and the prevention of NCDs, but the evidence suggests that this potential is not being realised. Findings from this doctorate may identify the leverage that is needed for centre-based childcare to positively influence children's nutrition and well-being and prevent diet-related NCDs and obesity on a broad scale.

#### **2.15.5 Research aim and objectives**

##### **Aims:**

Given these considerations, the overall aim of this thesis is to understand to what extent centre-based childcare services support children's rights to optimal nutrition and healthy food environments, according to the UNCRC. The secondary aim is to explore the barriers and enablers which influence the translation of evidence-based nutrition practice into everyday routines in centre-based childcare. Findings from exploring the views, barriers, and enablers to translation will be used to inform a Child Rights Situation Analysis of centre-based childcare services.

##### **Objectives:**

Careproviders, including cooks, directors and influential decision-makers in centre-based childcare, are the focus, rather than parents, as it is argued in this thesis, that it is the centre-based practices and the childcare environment that influences children's developing healthy food habits. Furthermore, parents delegate their role as primary carers to childcare personnel when their children are in care.



The research objectives are, therefore, as follows:

Objective 1: To explore childcare providers' experience and perceptions of implementing nutrition-related practices in centre-based childcare services to children aged 2-5 years.

Objective 2: To investigate what factors influence childcare providers' nutrition-related practices and decisions in centre-based childcare services to children aged 2-5 years.

Objective 3: To examine the barriers and facilitators to translating evidence-based practice into everyday routines enacted in centre-based childcare services to children aged 2-5 years.

Objective 4: To examine to what extent centre-based childcare services support children's rights to optimal nutrition and healthy food environments

## 3 Chapter Three: Epistemology, Methodology and Methods

### 3.1 Introduction

This chapter is in two sections. The first section briefly examines the epistemology used and discusses in more detail the methodology, theoretical frameworks and methods which underpin my research. The first section rationalises what worldview was used, what research strategies were employed and what methods were used to collect and analyse data. The second section discusses research design considerations such as rigor and trustworthiness, ethical considerations and my role as a researcher. Following this chapter, the methods used for each of the five studies undertaken as part of my research are described in more detail. Although the methods vary, the epistemology and methodology used are common to most of the studies. A brief explanation of the epistemology employed is as follows.

### 3.2 Epistemology

How we undertake research depends upon how we view the world and make sense of it (theoretical perspective) and the methodology we have chosen to undertake (Crotty, 1998). Crotty (1998) states that this worldview involves knowledge and assumes an understanding of what is involved in knowing, that is, 'how we know what we know' (Crotty, 1998 p.8). 'Knowing' relates to how we define truth and beliefs, and how we justify these. Inherent to both the theoretical perspective and methodology used therefore is epistemology, which is the theory of knowledge (Crotty, 1998).

In this thesis a constructivist epistemology was adopted which accepts that individuals construct meanings to seek understandings of the world in which they occupy (Crotty, 1998; Lincoln and Guba, 1985; Lincoln et al., 2011; Mertens, 2010). Different meanings of the same phenomena are considered of equal value and sustained by human interaction in a social context (Creswell & Poh, 2017; Crotty, 1998; Patton, 2015). Positioning the research undertaken in this thesis within constructivism has implications for the methodology and methods used.

### 3.3 Methodology

The epistemological position used in my research determined theoretical perspectives which inform the methodology (Crotty, 1998). Braun and Clarke (2013) describe methodologies as a framework within which research is conducted. This framework includes theories and practices about how research is carried out (Braun & Clarke, 2013). Together epistemology and methodology determine the research design.

In my research the methodological approach was qualitative, and the theoretical frameworks employed were the Ecological Model of Health Behaviour (Sallis & Owen, 2015) and the Child Rights Situation Analysis framework (Save the Children, 2014; UNICEF Program Division, 2014; UNICEF Division of Policy and Strategy, 2012). These three constructs will be described more as follows.

#### *Methodological Approach*

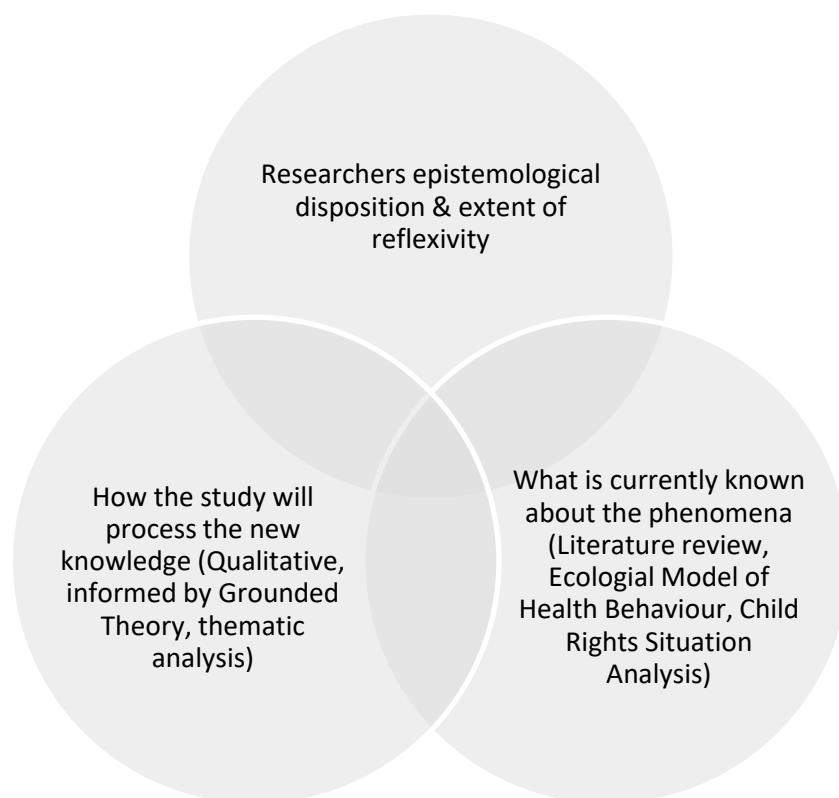
It follows that if humans construct meanings as they interact with their world, and these interactions are based on their experiences within their social and cultural perspectives then it is essential to understand these experiences, perceptions, interactions and meanings as they provide the rationale for human behaviours (Creswell, 2014; Crotty, 1998). Consistent with these assumptions, this research used a qualitative methodology which is ideal for understanding the phenomena under investigation from the participants' viewpoint (Creswell and Poh, 2017).

Characteristic of qualitative research (QR), that is relevant to my research, is that QR yields rich descriptions of meanings and the data is the language and the text of human behaviours (Creswell, 2014, Yilmaz, 2013). QR presents the participants' world view as accurately and as detailed as possible using participants' own words (Patton, 2015). It does not use or begin with preconceived theories or hypotheses (Koch, Niesz & McCarthy, 2014), and the research is inductive where the researcher generates meaning from the data collected (Creswell & Poh, 2017; Creswell, 2014; Crotty, 1998, Yilmaz, 2013). An inductive analysis is one of the characteristics that defines a qualitative approach as "it involves

answering open-ended research questions by reasoning from parts to a whole, from particulars to generals, or from the individual to the universal" (Koch et al., 2017 p. 137). New knowledge starts with the data (induction) rather than disproving a hypothesis (deduction). Each participant provides their unique experiences in a specific context, and therefore the findings are context-sensitive and not generalisable (Creswell & Poh, 2017). Qualitative methodology is therefore described as subjective (meanings are constructed through social interactions between participants and sustained through social behaviours), naturalistic (participants are studied in their natural setting), inductive (exploratory where new theories or explanations emerge from the data), ungeneralisable (findings are specific to the context being studied) and holistic (Creswell & Poh, 2017; Grbich, 1998; Yilmaz, 2013). As such, these characteristics determine the methods of the study design. Before justifying the methods used in my research, the next section will discuss the theoretical frameworks used within the QR undertaken in this thesis.

### **3.4 Theoretical perspectives and frameworks**

The application of a theoretical framework provides coherence and depth to the research (Collins & Stockton, 2018) and theories ground a methodological approach (Collins & Stockton, 2018). Collins and Stockton (2018) expand upon this and propose that the theoretical framework used not only includes the researcher's epistemological disposition (theoretical perspective) but also how the study will process the new knowledge and what is currently known about the phenomena. The theoretical framework, according to Collins and Stockton (2018), is at the intersection of these three components (depicted in Figure 3-1: A conceptual framework of the central role of theory in Qualitative Research). This model captures both the fundamental operating principles of the research and the researcher's pre-conceptions (Collins & Stockton, 2018). The three components that contributed to the theoretical framework used in my research are discussed in the following section.



**Figure 3-1:** A conceptual framework of the central role of theory in Qualitative Research used researching centre-based childcare personnel’s experience and perceptions translating nutrition best practice into daily routines (adapted from Collins & Stockton, 2018).

Collins and Stockton (2018) also reiterate that there is a complex relationship between researcher’s beliefs and interpretations (subjectivity) and the researcher’s ability to see, know, and consider these subjectivities (reflexivity). As part of explaining my epistemological disposition, and my subjectivity, there is a reflexivity statement in this chapter.

*Theoretical framework and methodological approach*

QR is not based on a single methodology and is described as “an overarching category, covering a wide range of approaches and methods found from within different disciplines” (Snape & Spencer, 2003 p.3 cited in Yilmaz, 2013 p.312). Consistent with this, the methodological, analytical approach (how the study will process the new knowledge) used in my research was informed by grounded theory. Many versions of grounded theory exist

since its development in 1967 by sociologists, Glaser and Strauss (Liamputtong, 2013). Grounded theory (GT) is a qualitative research method where a general explanation (theory) is generated (or constructed) by the researcher to explain phenomena from exploring the view of participants (Creswell, 2014; Creswell & Poh, 2017; Liamputtong, 2013). The essence of Grounded Theory (GT) is that the theory is generated from the data (participants' experiences within a phenomenon). More accurately, the theory is generated from the conceptualisation of the data. GT is best used for everyday life, where little is known in the literature and where the focus is meanings, processes and adaptations (Grbich, 1998). The choice to use an iteration of GT in my research is discussed in the following section.

#### *Methodological position informed by Grounded Theory*

My research was informed by grounded theory as it explored people's lived experience and provides an explanation (theory) of the translation of evidence-based nutrition practice into day-to-day practice using the data exploring childcare participants' experiences and views. Congruent with my research, GT lends itself to exploring the many different layers of interactions and influence that underpin a phenomenon (Braun & Clarke, 2013; Grbich, 2012), seen in the childcare setting.

My research was also consistent with theoretical sensitivity and theoretical sampling, which are two characteristics typical of GT (Braun & Clarke, 2013; Creswell and Poh, 2018; Liamputtong, 2013; Noble & Mitchell, 2016; Rupšienė & Pranskunien, 2010). Data collection and analysis occurred together, and data was inductively coded line-by-line, categorised and conceptualised following procedures informed by GT for theoretical sensitivity. The findings from each interview informed subsequent interviews and also informed subsequent sampling, which is characteristic of theoretical sampling (Braun & Clarke, 2013; Creswell and Poh, 2018; Liamputtong, 2013; Noble & Mitchell, 2016; Rupšienė & Pranskunien, 2010).

The GT version developed by Strauss and Corbin and adapted by Pidgeon and Henwood (2004) and Charmaz (2006) informed my research. Notwithstanding the controversies related to the use of different versions, all grounded theory is characterised by theoretical sensitivity, theoretical sampling and constant comparative analysis (Rupšienė & Pranskunien, 2010; Liamputtong, 2013). Theoretical sensitivity refers to the researcher's

ability to develop theoretical insights through the conceptualisation, organisation and visualisation of the data and to make something of these insights (Rupsiene & Pransciene, 2010). A principle of classic GT is that no pre-existing theory or hypothesis is used; the theory is sought to emerge from the data with the literature investigated after the analysis to avoid bias with existing theories (Rupsiene & Pransciene, 2010). Proponents of more flexible versions of grounded theory dispute this (Braun & Clarke, 2013) and argue that the initial stages of research require an overview of the relevant literature (e.g. for ethics approval or research proposals), and the accumulation of disciplinary knowledge and theories is difficult to 'un-know' (Braun & Clarke, 2013). Strauss & Corbin (cited in Rupsiene & Pranskunene, 2010 p.10) have conceded that researchers need some understanding of the researched phenomena before entering the research process. For these reasons, Braun & Clarke (2013) have labelled the more manageable version of grounded theory as 'grounded theory lite' and Charmaz (2006) as constructivist GT. As my research question was informed by the literature, and I am an experienced practitioner from the discipline of nutrition and dietetics, my research could never be impartial to pre-existing theories.

*Theoretical framework: pre-existing theories from what is known*

The third component contributing to a theoretical framework are theories derived from the literature (Crompton & Stockton, 2018). Bradbury-Jones, Taylor and Herber (2014) identify theory as having several functions in QR, including: justification of the research approach used, a framework for organising and reporting interpretations or data, and as a scheme for presenting findings. The Ecological Model of Health Behaviour (Sallis & Owen, 2015), referred to as EMHB or the Ecological Model, and the Child Rights Situation Analysis framework (Save the Children, 2014; UNICEF Program Division, 2014; UNICEF Division of Policy and Strategy, 2012), referred to as CRSA, fulfilled different purposes in this thesis and are described as follows.

### **3.4.1 The Ecological Model of Health Behaviour**

To understand the factors influencing nutrition-related practices in centre-based childcare, the EMHB was chosen as the most suitable theoretical framework for this research. Central

to the EMHB is that health behaviours are influenced by multiple factors including intrapersonal (individual's biology, psychological variables), interpersonal (social interactions, cultural considerations), organisational, community, physical environments and policy (Sallis & Owen, 2015). It is the environmental levels of influence that distinguish EMHB from other behavioural models that focus more on individual characteristics (such as knowledge, skills, beliefs, family) but do not explicitly consider broader environmental levels of influence, such as community, organisation or policy (Sallis & Owen, 2015). From a review of the literature (Chapter Two) many determinants at many different levels influence health behaviours including the provision and promotion of healthy nutrition in childcare settings; lending the phenomena to being described through the use of the EMHB.

Qualitative studies have explored the factors influencing nutrition-related decisions in non-parental childcare using versions of the EMHB (Hirsch, Lim & Otten, 2016; Lyn et al., 2014; Lynch & Batal, 2011; Otten, Hirsch & Lim, 2017; Ray, Maalta, Lehto, Roos & Roos, 2016; Sisson et al., 2017), supporting its use as a comprehensive framework for understanding the multiple and interacting determinants of health behaviours (Sallis & Owen, 2015). Moreover, Gubbels, Van Kann, de Vries, Thyges and Kremers (2014) have validated the use of the EMHB in childcare services. As such, the use of the EMHB by researchers internationally in countries comparable to Australia is a useful model to use in my research to understand the factors influencing nutrition-related practices in childcare.

Furthermore, by understanding the levels of influence and interacting determinants within the childcare setting, the EMHB can also be used in my research as a guide for examining practice and making recommendations for policy or effective approaches. Healthy behaviours are maximized when environments and policy support healthy choices and individuals are motivated and educated to make these choices (Ottawa Charter, 1989). Central to ecological models is that it takes both individual level and environmental level interactions to achieve health behaviour changes (Sallis & Owen, 2015). Sallis and others (2015) purport that multi-level strategies are most effective in changing health behaviours, a premise supported by work with changing levels of smoking and physical activity participation rates (Sallis et al., 2006).



The identification and naming of the various levels of influence in the EMHB have been described in numerous ways, including by Bronfenbrenner (1979) as micro, meso, exo environmental and by McLeroy and colleagues (1988) as intrapersonal, interpersonal, institutional, community and policy (Sallis & Owen, 2015). In the childcare setting, these levels are also given various names, demonstrating the diversity and adaptability of ecological models to local contexts (Sallis & Owen, 2015). Of relevance to my research, the EMHB is broad enough as an overarching theoretical framework (Sallis & Owen, 2015) that it can accommodate Hawkes et al's (2015) theory of change within it to assist describing the phenomena under study as four sub-environments (the social, food, information and policy environment).

#### *An alternative theoretical framework*

Alternative theoretical frameworks to the EMHB were considered in this thesis but discounted. Researchers undertaking other Australian studies have used the Transtheoretical Domain Framework (TDF) to identify factors from the literature that influence the implementation of dietary menu guidelines in childcare services (Seward et al., 2017) and to develop a multi-strategy intervention to improve childcare compliance with nutrition guidelines (Seward et al., 2017b). First published in 2005, (Michie et al., 2005) the TDF is made up of 33 behavioural theories, including the EMHB, broken down into 128 constructs (parts of theories) and grouped into 12 theoretical domains (a broad concept where theory applies e.g. knowledge). A subsequent version following a validation exercise was published in 2012 (Cane et al., 2012). To test whether the TDF was suitable, transcripts from my studies with cooks and directors undertaken as part of this thesis, were coded using the 12 theoretical domains. The outcomes were not as nuanced as using the EMHB. Furthermore, using the TDF disqualified the use of grounded theory thereby constraining the emergence of new theories because TDF is deductive against 33 behavioural theories.

Another theoretical framework considered was the Analysis Grid for Elements Linked to Obesity (ANGELO) which has been widely used to identify and prioritise environmental interventions for the prevention of obesity for nearly two decades (Swinburn, Egger, & Raza, 1999; WHO, 2012). ANGELO was discounted because it is specific to designing obesity-related interventions and not for understanding the phenomenon under study. Although

ANGELO has been used to measure obesogenic elements in school environments and school canteens NZ (Carter & Swinburn, 2004) it has not been used for childcare environments.

### **3.4.2 Child Rights Situation Analysis**

To understand how centre-based childcare settings support children's rights to optimal nutrition, a Child Rights Situation Analysis (CRSA) was chosen as the framework for this doctorate. A CRSA is 'an in-depth description of the extent to which children's rights are being enjoyed and an analysis of the obstacles to, and enablers of, their realisation' (Save the Children 2014 p. 6). The UNCRC underpins the implementation of a CRSA and is the first point of reference. The CRSA can be scaled up as an analysis of children's rights in a country or scaled down to address specific health related themes within smaller settings (Ferguson et al., 2016; UNICEF Programme Division, 2014; UNICEF, 2012), such as nutrition in childcare. The steps involved in undertaking a CRSA and used in the studies undertaken in this doctorate are summarised as follows.

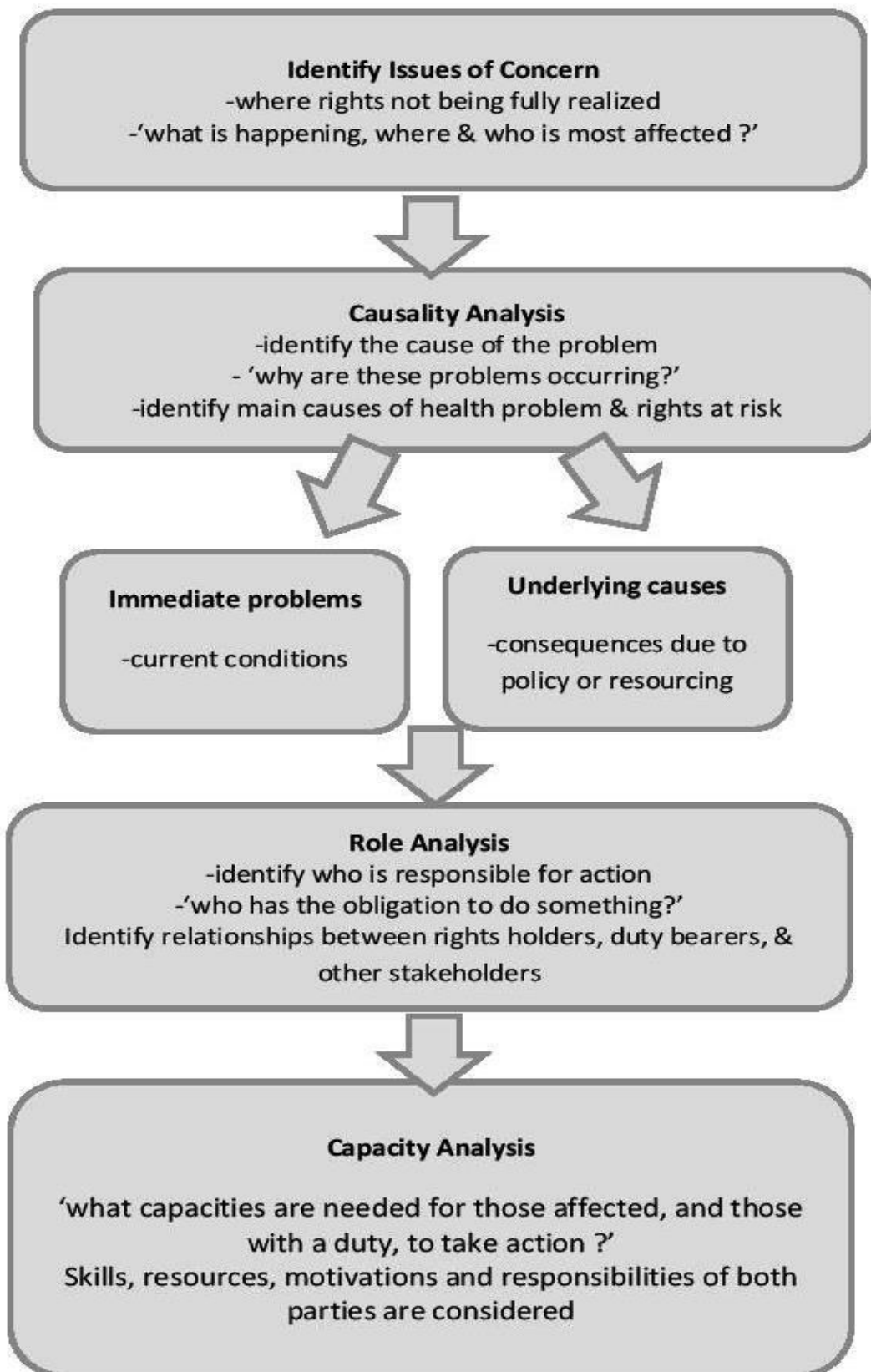
The initial step in a CRSA is identifying the issues of concern, where children's rights are suspected of not being fully realised and where there is a need to be addressed (Save the Children, 2014). This assessment identifies 'what is happening, where and who is more affected?' (WHO & United Nations Human Rights Office of High Commission n.d p. 2). Following this is a causality analysis which identifies 'why are these problems occurring?' (WHO & United Nations Human Rights Office of High Commission n.d p. 2), that is, the cause of the problem, event or situation. In a CRSA, causes include the immediate problem (current conditions) and the underlying, or root cause, of a problem (e.g. consequences of policy and availability of resources). A causality analysis results in the main causes of the health problem being identified and the rights that are being violated or at risk of being violated are listed (Jonsson, 2003).

The next step in a CRSA is a role analysis where 'who has the obligation to do something about it?' is identified (WHO & United Nations Human Rights Office of High Commission n.d p. 2). Furthermore, as part of the role analysis, the relationships between the identified rights-holders, duty-bearers and other key stakeholders are discussed and their obligations listed. Lastly a capacity analysis identifies 'what capacities are needed for those affected,

and those with a duty, to take action?’ (WHO & United Nations Human Rights Office of High Commission n.d p. 2). The skills, resources, responsibilities and motivations needed by those most affected in order for their rights to be fulfilled is examined (Jonsson, 2003; Dixon, 2014). To have capacity, duty bearers need to accept responsibility for their role in the realisation of children’s rights and have authority and access to resources to do so (Jonsson, 2003).

Using the information in the described steps, interventions and solutions are recommended to close the gap between right-holders’ rights and what they need, and to increase duty-bearers capacity to fulfil right-holders’ rights. A more detailed description of the CRSA framework can be found elsewhere (Save the Children, 2014; UNICEF Programme Division, 2014; UNICEF, 2012) and Figure 3-2 illustrates the process of undertaking a Child Rights Situation Analysis (adapted from Save the Children, 2014; UNICEF Programme Division, 2014; UNICEF, 2012).

The CRSA process undertaken in my research and the results are described later in this thesis. Using the results from the outcomes of the three empirical studies against the EMHB, and the CRSA, actions are recommended in the final chapter of this thesis. These recommendations include actions to protect, promote and provide young children with optimal nutrition and the conditions to support good nutrition and prevent NCDs.



**Figure 3-2:** A flowchart the process of undertaking a Child Rights Situation Analysis (adapted from Save the Children, 2014; UNICEF Programme Division, 2014; UNICEF, 2012).

### 3.5 Method

Together, epistemology and methodology determine the methods that are applied in research. The theoretical perspective of these determines the methods used for: sampling, data collection, analysis, interpretation and for research rigor and trustworthiness (Creswell, 2014). Qualitative studies are concerned with process, context, meaning, interpretation and understanding through inductive reasoning (Yilmaz, 2013). In this section, an overview is presented of the methods used in my research. The specific method for each of the five studies undertaken in this doctorate are discussed separately in Chapters Four, Five and Six.

In the three empirical studies undertaken in this doctorate, centre-based childcare cooks, childcare centre directors and influential decision-makers were interviewed to understand the evidence-to-practice gap and the extent of people's understanding of the rights of the child to optimal nutrition. Cooks were interviewed as most services employ a cook to provide at least a cooked lunch and three mid meals from core ingredients. Directors were also included because they are responsible for nutrition-related services and manage day-to-day operations. Furthermore, studies in the literature predominately interview directors. Directors declined the invitation for educators who work directly with the children to be interviewed because legislated staffing ratios prevent educators leaving the rooms for interviews during work time, and interviews after work were inconvenient as most educators had family commitments. Educators however had a close daily working relationship with the director and the director over sighted educator practices, deeming it acceptable to not interview educators.

Creswell & Poh (2017) recommend that participants, who will best help the researcher understand the phenomena and the research question, be intentionally chosen. This research used purposeful maximum variation sampling, recommended in the literature (Harris et al., 2008; Suri, 2011). A sampling grid was constructed for each empirical study identifying features of the phenomenon being explored (Suri, 2011). Views that vary from each other as much as possible were also sought. Furthermore, non-random sampling is acceptable because individual participants are not chosen as representative of a larger population but for their personal experiences with the phenomena being explored (Koch et al., 2014). Unique to QR, and typical of grounded theory, the sampling occurred in the

natural setting where participants experience the phenomena under study (Creswell, 2014; Grbich, 2012).

Different variables considered for purposefully sampling childcare centres included: whether the centres were not-for-profit community childcare centres, private businesses or private social enterprises; the geographical location of centres; the SEIFA (Socio-Economic Indexes for Areas) location of centres, and the age of the business (Appendix 2: Sampling grid for selecting centres from which participants were interviewed). In SA two of the three private franchises are social enterprises made up of consortia of well-established charity organisations. The third franchise was developed by entrepreneurs committed to a corporate strategy of growth and sustainability, quality education and care, employees' development, community engagement and profitability. Geographical location and SEIFA were considered because children living in relatively disadvantaged areas benefit most from nutrition-related interventions directed at childcare (Morris, Skouteris, Edwards, & Rutherford, 2014). SEIFA ranks areas in Australia according to relative socio-economic advantage and disadvantage using national census data (Australian Bureau of Statistics, 2017). Centres vary in SEIFA geographically, with centres located in the outer southern, outer northern metropolitan suburbs and regional areas in rural SA being of a greater disadvantage compared to childcare services in other areas of metropolitan Adelaide. Notably, SEIFA is a crude measure for centres because children who attend a centre may live elsewhere, but the parent's workplace may be close-by. How many years the centre had to work towards accreditation was also a consideration as new centres need several years to achieve accreditation.

Sampling occurred within each study until 'saturation' when no new information was gathered from participants or new themes emerged (Namey, Guest, McKenna & Chen, 2016). In keeping with grounded theory, theoretical sampling was iterative with interviews informing whom to interview next (Rupšienė & Pranskuniene, 2010). Data analysis and data collection co-occurred, and interviews were arranged to explore emerging theories as they developed. Similarly, the findings from the first study with cooks were included when interviewing directors and the findings from both the first and second study were included

when interviewing influential decision-makers. The sampling criteria specific to each empirical study are discussed in Chapter Five.

### **3.5.1 Data collection**

In QR it is considered a privilege to have the opportunity to hear from participants of their lived experience and views (Creswell, 2014), and in my research care was taken to collect their voice, not the researcher's. Participants were asked open-ended questions to allow rich descriptions which were not biased by the researcher's preconceived ideas (Creswell, 2014, Koch et al., 2014). Semi-structured interviewing provided the flexibility to probe or respond to emerging themes by asking more questions (Creswell & Poh, 2017; Goodell, Stage & Cook, 2016) and participants were interviewed individually in their natural setting (predominately the workplace).

The semi-structured questions were informed from the literature review, theoretical framework (EMHB) and the researcher's experience (described later in this thesis). Questions were piloted with participants and the resulting interview schedule used as a guide (Creswell & Poh, 2017). Interviews were recorded and transcribed verbatim. Other necessary forms of data collected included memos and a reflection following each interview (Koch et al., 2014). Memos recorded observations and reflections by the researcher on relevant actions, interactions and events and relevant points from constant comparisons with other interviews (Rupšienė & Pranskuniene, 2010; Corbin & Strauss, 2008). An audit trail rationalising changes en route, and the actual course of the research, was also recorded (Koch et al., 2014). Memo writing is a critical tool in GT for generating theory and includes theoretical notes about data and connections between categories (Rupšienė & Pranskuniene, 2010; Corbin & Strauss, 2008).

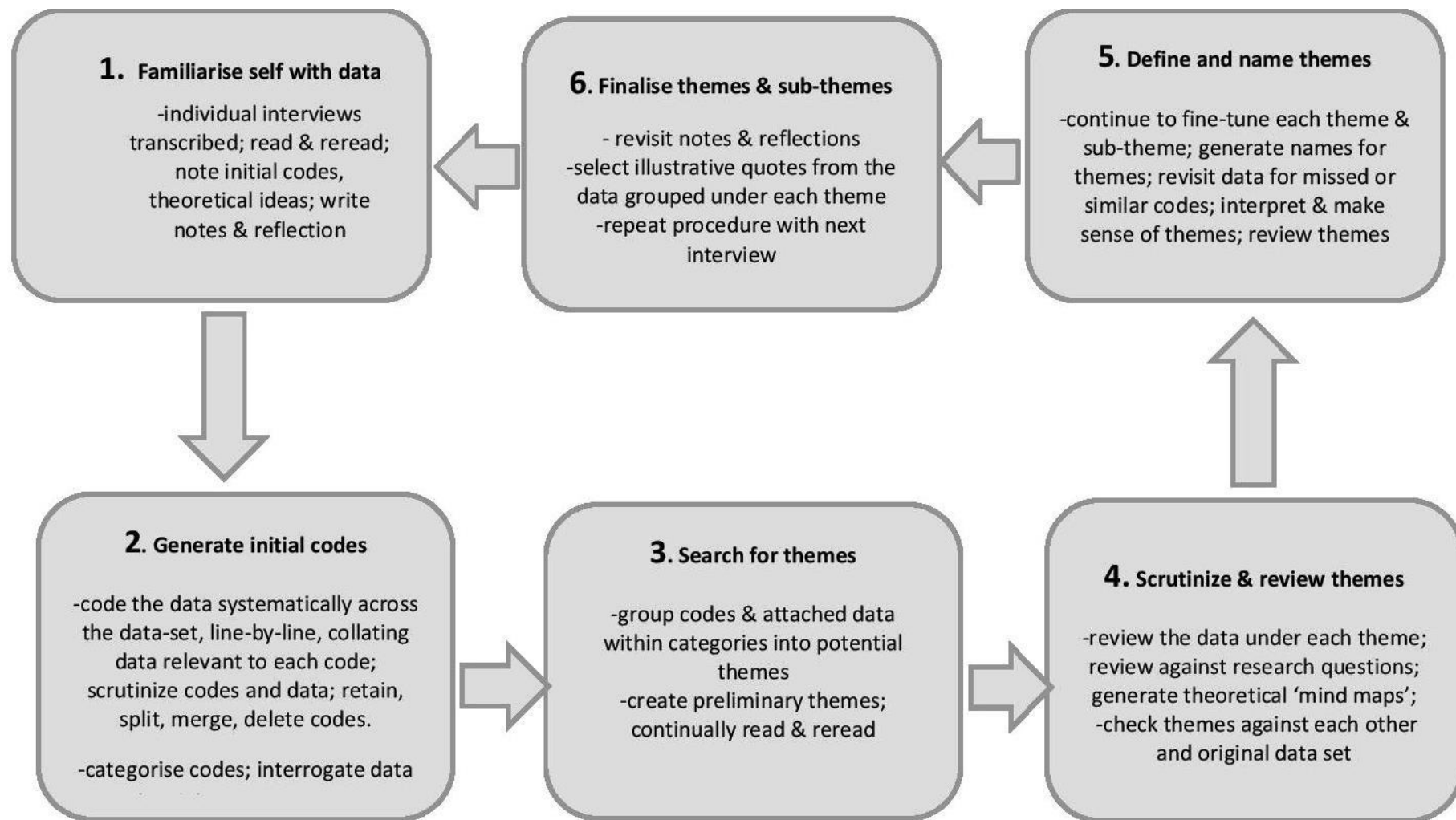
### **3.5.2 Data Analysis**

The data analysis method used in this research was thematic analysis (Braun & Clarke, 2006) which has been described as including six-steps. One of the initial steps includes direct

content analysis (described by Hsieh & Shannon, 2005) and a hybrid of inductive and deductive analysis (Fereday & Muirane, 2006). Although presented as a step by linear step procedure, research analysis was an iterative and reflective process with constant comparisons between the data and emerging themes, typical of GT (Fereday & Muirane, 2006; Noble & Mitchell, 2016; Rupšienė & Pranskuniene, 2010).

The copious and rich data were 'winnowed' and over several steps aggregated into smaller, discrete themes which generated an explanation (Braun & Clarke, 2006; Creswell, 2014). The process used is depicted in Figure 3-3: Flowchart of the steps undertaken in the analysis of the data from cooks, directors and influential decision-makers. Firstly, the data was coded line-by-line, followed by the aggregation of the codes into categories. Codes were categorised into groups based upon common concepts, including levels of interaction. The categories were interrogated both within and between categories, and themes relevant to the phenomena searched. Patterns, categories and themes were built bottom-up by organising the coded data into increasing numbers of discrete units of information. This process of analysis involved repeated work cross-referencing and revisiting the themes and data until a comprehensive set of themes was generated. The data was then revisited deductively to see if relevant evidence was missed or whether more research was needed (Braun & Clarke, 2006; Braun & Clarke 2013; Creswell 2014; Creswell & Poh, 2017; Fereday & Muirane, 2006).





**Figure 3-3:** Flowchart of the steps undertaken in the analysis of the data from cooks, directors and influential decision-makers (Braun & Clarke, 2006; Creswell, 2014; Hsieh & Shannon, 2005; Fereday & Muirane, 2006)

### 3.5.3 Interpretation

Consistent with qualitative research approaches, care was taken in my research to achieve the following (Collins & Stockton, 2018; Daly, 2009; Patton, 2002; Yilmaz, 2010):

- Keep findings in context as they are specific to that group and setting and reporting personal or professional information that impacts data collection, analysis and interpretation
- Bracket points of views or biases for examination
- Make my predispositions, views and biases explicit
- Provide enough quotes from participants to support the findings.

In my research, the generated theory from the data was further examined by comparing the findings with those in the literature and other relevant theories (Bradbury-Jones et al., 2014). Integral to this process was the worldview and lens that I brought to the research as the researcher, which is elaborated as follows.

### 3.5.4 Reflexivity

The researcher is recognised as being involved in an intense experience with the participants throughout the process of data collection, analysis and interpretation (Creswell, 2014). In QR the researcher is accepted as key in collecting data (Koch et al., 2014) and even described as the research instrument (Yilmaz, 2013). Unwittingly, the researcher shapes the research process by bringing their experience and background to the analysis and interpretation of the data (Braun & Clarke, 2006; Malterud, 2001; Tong, Flemming, McInnes, Oliver, & Craig, 2012). The researcher, therefore, needs to be cognizant of their influence on all aspects of the research, from interacting with participants and generating an understanding of these interactions to how the researcher's world view and experience shape the interpretation of the data (Koch et al., 2014).

Reflexivity is described by Koch et al. (2014 p.138) as 'critically self-reflecting on one's biases, theoretical predispositions, and professional and personal orientations to the

phenomenon one is studying and how these may influence data collection and analyses'. Reflexivity requires openness by the researcher to how their subjectivity influences the research; keeping a reflective journal or similar tool and considering and declaring any possible biases at every stage of the research process (Koch et al., 2014). A principle of QR is that an intertwined relationship exists between the researcher and the participants and that a researcher cannot separate themselves from this despite every effort. As a consequence, the resulting influence of the researcher on shaping the research process and outcomes are accepted (Creswell & Poh, 2017; Crotty, 1998; Liamputtong, 2013; Patton, 2015; Yilmaz, 2013). Reflexivity is the extent to which researchers acknowledge their ability to see, know, and consider their subjectivities that influence the study (Collins and Stockton, 2018).

The process of reflexivity provided me with insights about what I brought to the research process, my motivations, beliefs and values. In this research, my perspective on nutrition in centre-based childcare aligns with a public health approach underpinned by strong primary health care principles (Talbot & Verrinder, 2017). I identify as a health professional with considerable experience working with early education and childcare services, as a trained community-based, public health dietitian-nutritionist and as a mother with experience in the distant past on Childcare Management Committees, and as a mother with children progressing through centre-based childcare from 8 months of age. From the onset of this research, I have been mindful of my background, experience and the 'lens' or filter that I bring.

To identify and understand the extent of my subjectivity and my influence on participants, data collection, analysis and interpretation of the findings, I have kept reflections on interviews each step of the research process. Through reflective practice, I have endeavoured to identify my views, assumptions, and beliefs and tried to control or suspend these. I have continually reflected on how my presence and worldviews have influenced data collection, analysis and interpretation. My ongoing interest in research with children, nutrition, and formal and informal childcare has informed my approach to QR to be curious, enquiring, respectful and non-judgmental and aware of the power relations between health professionals providing nutrition practice advice and cooks and educators enacting these.

Several strategies were used to minimise these effects and to ensure study rigor and trustworthiness in this doctoral research.

### **3.6 Rigor**

Qualitative methodology has been labelled as ill-defined as it seeks to describe and explain many subjective truths that make up humans' experiences in a complex world (Crotty, 1998). Questions about the trustworthiness of QR are common in the literature. Lincoln and Guba (1985) explain that:

“the basic issue in relation to trustworthiness is simple: How can an inquirer persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to, worth taking account of?” (p. 290).

Researchers must demonstrate to readers that they used rigorous procedures including those which “prevent the disregard for and distortion of the experiences and perspectives of the research participants” (Niesz, Koch & Rumrill, 2008, p.119).

Rigor and trustworthiness is achieved in QR by addressing issues of credibility, dependability, transferability and authenticity (Bradbury-Jones et al., 2014; Creswell & Poh, 2017; Fereday & Muirane, 2006; Fossey, Harvey, Mcdermott, & Davidson, 2002; Koch et al., 2014; Malterud, 2001; Patton, 2002; Tong et al., 2012; Wu et al, 2017; Yilmaz, 2013). In my research, the strategies purposefully used are listed in the following text box:

Strategies used to ensure rigor and trustworthiness in my research:

- Sampling rigor: ensuring that the participants recruited could provide the data sought, using purposeful variation sampling, using theoretical sampling (Creswell & Poh, 2017; Suri, 2011; Rupšienė & Pranskuniene, 2010)
- Procedural rigor: providing a detailed explanation of the methods, producing a thick description of the phenomena from participants, providing descriptive data that readers and participants can immerse themselves in, inviting peer debriefs and review (Creswell & Poh, 2017; Collins & Stockton, 2018; Patton, 2002; Yilmaz, 2013)
- Reporting rigor: interpreting and representing the views of the participants accurately through the use of semi-structured questions which allow participants to tell their story, transcribing what was said verbatim, identifying illustrative quotes from the raw data relevant to each theme, summarising each interview and asking participants whether they wanted to change what was said or add more, and inviting participants to comment on a summary of the generated themes (Daly, 2009; Koch et al., 2014; Fossey et al., 2002; Malterud, 2001; Yilmaz, 2013).
- Procedural and reporting rigor: undertaking a constant comparison of interview data and triangulating data (Creswell & Poh, 2017) between cooks, directors, influential decision-makers and literature findings.
- Including reflexivity and consideration of my subjectivities which influences the study (procedural and reporting rigor).
- Checking study outcomes with credible reporting guidelines (O'Brien, Harris, Beckman, Reed & Cook, 2014).
- Theoretical rigor: ensuring the research design has relevant theoretical underpinnings, and that the findings are interpreted against current theory and empirical evidence (Bradbury-Jones et al., 2014; Collins & Stockton 2018)

Included in my research, were three qualitative enquiry elements described by Patton (2002):

1. Rigorous methods that produced high-quality data that is systematically analysed using credible methods
2. Philosophical beliefs in the value of qualitative inquiry including attention to purposeful sampling, naturalistic inquiry, QR methods, inductive analysis and holistic thinking beyond the individual
3. Credibility of the researcher dependent upon their discipline training, experience, track record and representation of self.

My credibility as a researcher was addressed through reflective practice and reflexivity discussed previously and is elaborated on as follows with a discussion on ethical considerations.

### **3.7 Ethical considerations**

This research received ethics approval from two committees: the Social, Behavioural Research Committee, Flinders University (project number: 7758) and the Department of Education and Children's Services (DECD), South Australian Government (Appendix 3: Letter of Introduction, Information Sheet and Consent Form examples). Considerations given attention in my research were: attaining informed consent, issues of confidentiality and anonymity, minimising disruption to the caring of children, issues of entering the childcare setting, researcher subjectivity, and researcher presence in the process of collecting data.

Full disclosure of the nature of the research was provided to participants as an information sheet and a verbal overview by the researcher before each interview. It was reiterated that participants had the right to refuse to participate and could withdraw from the research at any time. Signed consent forms were stored electronically in a password protected repository and the data sources were only available to the research team (Liamputtong, 2013). Cooks needed their director's permission before participating. Directors received an invitation for the cook to participate in the study and, if the director was amenable, the researcher then contacted the cook for an appointment at a place convenient to the

participant. Most of the participants, including those from all three empirical studies, chose to be interviewed at their workplace at a time which would cause minimal disruption to the service (usually on a Friday for directors, and during lunch for cooks or at the end of their four-hour shift).

To ensure anonymity, participants were not referred to by name in the study and a pseudo name was used in the reporting for the participant and the centre. In reality, total anonymity could not be guaranteed when interviews were held in the workplace and the service only had one cook. This risk was checked with participants beforehand and participants invited to share with their colleagues' written information on the study if they wanted to.

According to the principle of non-maleficence, researchers have the responsibility of ensuring that participants are not affected adversely by the research (Liamputtong, 2013). Although this research did not directly involve children, working on sites with children required screenings by various government bodies and a national police check, all of which were undertaken by the researcher and documented on the letter of introduction from the two ethics committees.

The five studies undertaken in this doctorate are presented in the next three chapters. Each study starts with a brief introduction, a description of the methods used, results, and a discussion of the findings.

## 4 Chapter Four: Characteristics of Effective Interventions Promoting Healthy Eating for Pre-Schoolers in Childcare Settings: An Umbrella Review

### Preface

This published paper is an umbrella review (i.e. a systematic review of systematic reviews) of empirical studies examining the characteristics of effective interventions promoting healthy eating for pre-schoolers in childcare settings. The purpose of research was to summarise current knowledge relating to the effectiveness of nutrition best practice translated into nutrition-related interventions. These findings will inform the empirical aspect of this thesis. The published paper included here is unmodified, except the sub-headings have been renumbered. The references are also in the style specified by the journal.

This paper has been peer-reviewed and published with the citation,

Matwiejczyk, L., Mehta, K., Scott, J., Tonkin, E., & Coveney, J. (2018). Characteristics of Effective Interventions Promoting Healthy Eating for Pre-Schoolers in Childcare Settings: An Umbrella Review. *Nutrients*, *10*(3), 293-315. <http://dx.doi.org/10.3390/nu10030293>  
© 2018 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

An additional appendix of study figures and tables can be found in the Appendices (Appendix 4, Appendix 5, Appendix 6, Appendix 7) or online in a repository at [www.mdpi.com/2072-6643/10/3/293/s1](http://www.mdpi.com/2072-6643/10/3/293/s1) comprising: Table S1: Record of search strategies; Table S2: Critical appraisal results for the included reviews using 11 critical appraisal criteria (The Johanna Briggs Institute, 2014); Table S3: Characteristics of included systematic reviews (using JBI Data Extraction Form for Systematic Reviews and Research Syntheses, Aromataris et al., 2015; The Johanna Briggs Institute 2014; Table S4: Summary of the evidence from selected reviews using the JBI data extraction checklist (The Johanna Briggs Institute, 2014); Figure S1: PRISMA flowchart of the selection process for systematic reviews. Author Contributions: Louisa Matwiejczyk (LM) contributed to the study design, search strategy, assessment of methodological quality, data extraction, qualitative analysis, results



interpretation and manuscript preparation. Associate Professor Kaye Mehta (KM) contributed to results interpretation and manuscript preparation. Professor John Coveney (JS) contributed to results interpretation and manuscript preparation. Emma Tonkin (ET) contributed to the assessment of methodological quality, data extraction and manuscript preparation. JC contributed to results interpretation and manuscript preparation.

## **Abstract**

Early Childhood Education and Care (ECEC) settings have a pivotal role in shaping children's dietary food habits by providing the contextual environment within which they develop these behaviours. This study examines systematic reviews for (1) the effectiveness of interventions to promote healthy eating in children aged 2–5 years attending centre-based childcare, (2) intervention characteristics which are associated with promoting healthy eating and, (3) recommendations for child-health policies and practices. An Umbrella review of systematic reviews was undertaken using a standardized search strategy in ten databases. Twelve systematic reviews were examined using validated critical appraisal and data extraction tools. Children's dietary food intake and food choices were significantly influenced. Interventions to prevent obesity did not significantly change children's anthropometric measures or had mixed results. Evidence was more convincing if interventions were multi-component, addressed physical activity and diet, targeted individual-level and environmental-level determinants and engaged parents. Positive outcomes were mostly facilitated by researchers/external experts and these results were not replicated when implemented in centres by ECEC providers without this support. The translation of expert-led interventions into practice warrants further exploration of implementation drivers and barriers. Based on the evidence reviewed, recommendations are made to inform child-health directed practices and policies.

**Keywords:** dietary intake; healthy diet; pre-schooler; obesity prevention; social-ecological model; review

## 4.1 Introduction

Good nutrition in early childhood is essential to ensure children reach their growth and developmental potential [1]. Furthermore, dietary health behaviours and food preferences are learnt early and carry through into adulthood [2,3]. In all ages, and increasingly in younger populations, poor food choices and overconsumption are associated with a higher risk of developing obesity [4,5]. Excessive weight developed in early childhood is particularly problematic as it is associated with an increased risk of developing physical, social and psychological conditions and earlier onset of non-communicable diseases (NCD) [6–8]. Contrary to popular belief, many children carrying extra weight do not outgrow it [9] and childhood-onset obesity is particularly difficult to address in later life [10]. As such, concern for children’s health, and escalating rates of NCD, have prompted the prioritization of healthy diets for young children globally [11,12].

Considerable public health effort and research have been directed towards nutrition interventions in the home and the school setting [13,14]. However societal changes to mothers’ workforce participation have increased the relevance of the childcare setting as a location for intervention in countries such as the United States, Canada, Europe, the UK and Australia. In the United States, more than 21 million preschool-aged children receive childcare and nearly 60% of these children receive centre-based childcare [15]. In Australia, nearly half of children under five years of age attend childcare with nearly a quarter receiving formal childcare [16]. Although hours vary considerably [17] children in many European Organisation for Economic Co-operation and Development (OECD) countries and 70% of Canadian pre-schoolers with working parents spend more than 30 h per week in formal childcare [18,19], where children receive up to 70% of their daily nutrition [20].

Although the home is still the primary influence [21,22], centre-based childcare has a pivotal role in shaping children’s dietary habits by providing a contextual environment within which they develop these behaviours. As such, experts have recommended that interventions promoting healthy eating and preventing obesity be targeted at childcare services [23,24]. In response to the plethora of research evidence this decade, several systematic reviews

have been undertaken to investigate the effectiveness of lifestyle-related interventions in childcare. The systematic reviews relating to pre-schoolers and healthy eating have been predominantly about preventing or managing obesity, with a focus on the effectiveness of interventions which change weight status [25]. Other systematic reviews have focused on specific determinants of obesity such as diet, physical activity and other obesogenic behaviours including sedentary behaviour and sleep [26,27] or type of intervention such as educational and lifestyle interventions [28], influence of the food environment [29] or nutrition policies at child-care centres and impact on role modelling [30]. The range of research questions in these reviews has been wide, as have been the recommendations for decision-makers, practitioners and policymakers. Given this surfeit of systematic reviews, a review is warranted of existing reviews to provide a concise overall examination of the large and diverse body of information.

Umbrella reviews are becoming relatively common [31,32] as a means of providing an overall examination of a broad range of topics within a similar area of interest [33,34]. A growing number of guidelines and resources address the methodological rigour of this type of evidence synthesis [33,35,36]. Umbrella reviews only use the highest level of evidence, that is, other systematic reviews, and provide a means to compare and contrast the findings from different systematic reviews as well as a summary of the evidence for healthcare decision-makers [33]. This is the first Umbrella review to provide a systematic examination and overview of a broad range and number of reviews investigating the effectiveness of interventions and practices promoting healthy eating behaviours in 2–5 years old in centre-based childcare.

### *Objectives*

The primary aims of this Umbrella review are to examine previously published systematic reviews to determine (1) the effectiveness of interventions to promote healthy eating in children aged 2–5 years attending centre-based childcare; (2) intervention characteristics which are associated with successfully promoting healthy eating in pre-schoolers; and (3) recommendations for child-health directed policies and practices.

## 4.2 Materials and Methods

### 4.2.1 Search Strategy and Eligibility Criteria

To identify possible systematic reviews the online bibliographic databases Medline, Emcare (New York City, USA), PsycINFO (Washington, DC, USA), Embase (Amsterdam, Netherlands), CINAHL (Ipswich, Massachusetts, USA), Health Technology Assessment Database, ERIC, Scopus, Web of Science Core Collection, Joanna Briggs Institute (JBI) Evidence-Based Practice Database of Systematic Reviews and COCHRane Database of Systematic Reviews were searched for reviews published between January 2000 and September 2017. The search strategy is available as Table S1: Record of search strategies in an online repository of supporting materials (or Appendix 4). In addition to the online search, relevant grey literature sources were searched including key government and organisational websites, National Library catalogues, conference proceedings, theses repositories, and clinical trial registries. The literature search of reviews not produced by commercial publishers was restricted to reports produced since January 2000 from comparable high-income countries, including Australia, New Zealand, Canada, Europe, the United Kingdom, and the United States [37]. The JBI Database of Systematic Reviews and Implementation Reports, the COCHRane Database of Systematic Reviews, and the PROSPERO register were searched for prospective systematic review protocols. Reference lists of included systematic reviews were checked to identify any missed studies. Reviews were those published post-January 2000, as few systematic reviews, in general, were published using Preferred Reporting Items for Systematic Reviews (PRISMA) prior [33] and most primary studies relating to lifestyle and childcare have been published in the last decade [38,39]. No language limitations were applied. Reviews were included if they met the PICO-derived inclusion criteria: (1) reviews of studies of children aged 2–5 years attending centre-based childcare (defined as regulated childcare held outside of the home and provided by non-relatives, also known as nurseries, day care, preschools, long day care and kindergarten) or of childcare educators (those directly working with children and those indirectly working with children including cooks); (2) reviews of studies which considered interventions or behaviour change strategies with the intent to improve or promote healthy eating; (3) reviews of studies of any study design,

with or without a comparison group, with outcomes measured at baseline and post-intervention; (4) reviews of studies with measurable outcomes for food and dietary behaviours or nutrition practices. Reviews considered included systematic reviews, meta-analysis, overviews of reviews, review of reviews and narrative reviews.

The following reviews were excluded: (1) studies with infants or studies where the children were attending compulsory schooling usually six years or older; (2) studies treating children for obesity or a clinical related condition; (3) studies using school, the home or settings which are not registered childcare; (4) studies in which dietary behaviour or dietary-related outcomes were secondary outcomes and not separately reported; (5) studies focused on low-income countries. Although the search strategy did not limit studies to particular countries, only systematic reviews relating to high-income countries as defined by the OECD (2017) were included because the childcare arrangements and practices are similar. An a priori protocol for the Umbrella review was registered with PROSPERO (CRD42017078749).

#### *4.2.2 Assessment of Methodological Quality and Data Extraction*

To assess the methodological quality of the reviews and to determine the extent to which reviews had addressed the possibility of bias in the design, conduct and analysis, the Johanna Briggs Institute (JBI) Critical Appraisal Checklist for Systematic Reviews and Research Syntheses was used [33]. This validated 11-item checklist has been subjected to extensive peer review. Two reviewers independently (L.M., E.T.) assessed the eligible reviews after discussing each item in the appraisal instrument to gain a common understanding of what constitutes appropriate levels of information and the criteria for a positive, negative or unclear response. After the independent assessment, the two reviewers met to discuss the individual items for each study and if there was disagreement, a third reviewer independently reviewed the study to resolve the decision (J.C.).

To guide the extraction and synthesis of data from the selected studies and minimize the risk of author bias, a standardized tool, the JBI Data Extraction Form for Systematic Reviews and Research Synthesis [40] was employed independently by the same two reviewers.

Information extracted from each review included the following: (1) Review characteristics: author/year, objectives, participants (characteristics/total number), setting/context, interventions of interest, number of databases/sources searched, date range of included studies, number of total studies included, detailed description of the included primary studies related to healthy eating promotion (number/type of studies/country of origin), appraisal instrument and rating, method of analysis and outcomes assessed; and (2) Review Results: significance/direction, heterogeneity and significant findings/outcomes of the review. Prior to the process, the two reviewers discussed each of the tool's items for a common understanding and to identify any additional data which might need to be extracted. It was agreed to also include factors or characteristics of interventions that influence intervention effect, the use of any underpinning behaviour change or health promotion theories, author recommendations for practice and author recommendations for research. Following this process and discussion, if there was any uncertainty with data extraction, a third experienced reviewer was consulted (J.C.).

## **4.3 Results**

### *4.3.1 Study Selection Process*

The study selection process is summarised in Figure 4-1: PRISMA flowchart of the selection process for systematic reviews (available in the online data repository). In total, 1785 citations were initially identified. After duplicates were removed the title and abstract of 983 citations were screened for relevance and 21 studies were identified for full-text analysis. Four additional studies were included from manual searching of references and citation snowballing [41–44]. A search of the grey literature did not identify any additional eligible reviews. The 25 full-text systematic reviews were screened and 11 systematic reviews excluded [14,42–51] because the dietary outcomes were not separately reported, there was too little information, the age group related to children attending school and/or relevant outcomes were not measured (Figure S1). Fourteen systematic reviews were considered eligible for the present Umbrella review. Of the 14 included reviews, seven stated obesity-related physiological outcomes, for example, Body Mass Index (BMI) as the

primary outcome, with diet-related outcomes reported separately as secondary outcomes [38,39,52–56]. The other seven studies addressed diet-related behaviours as the primary outcomes [23,41,57–61]. Two systematic reviews were excluded when assessed for methodological quality [23,41]. The methods of these reviews were not described in enough detail to determine robustness and were published before PRISMA guidelines were used. Agreement between the two reviewers was strong and statistically significant (Kappa score  $p < 0.0005$ ).

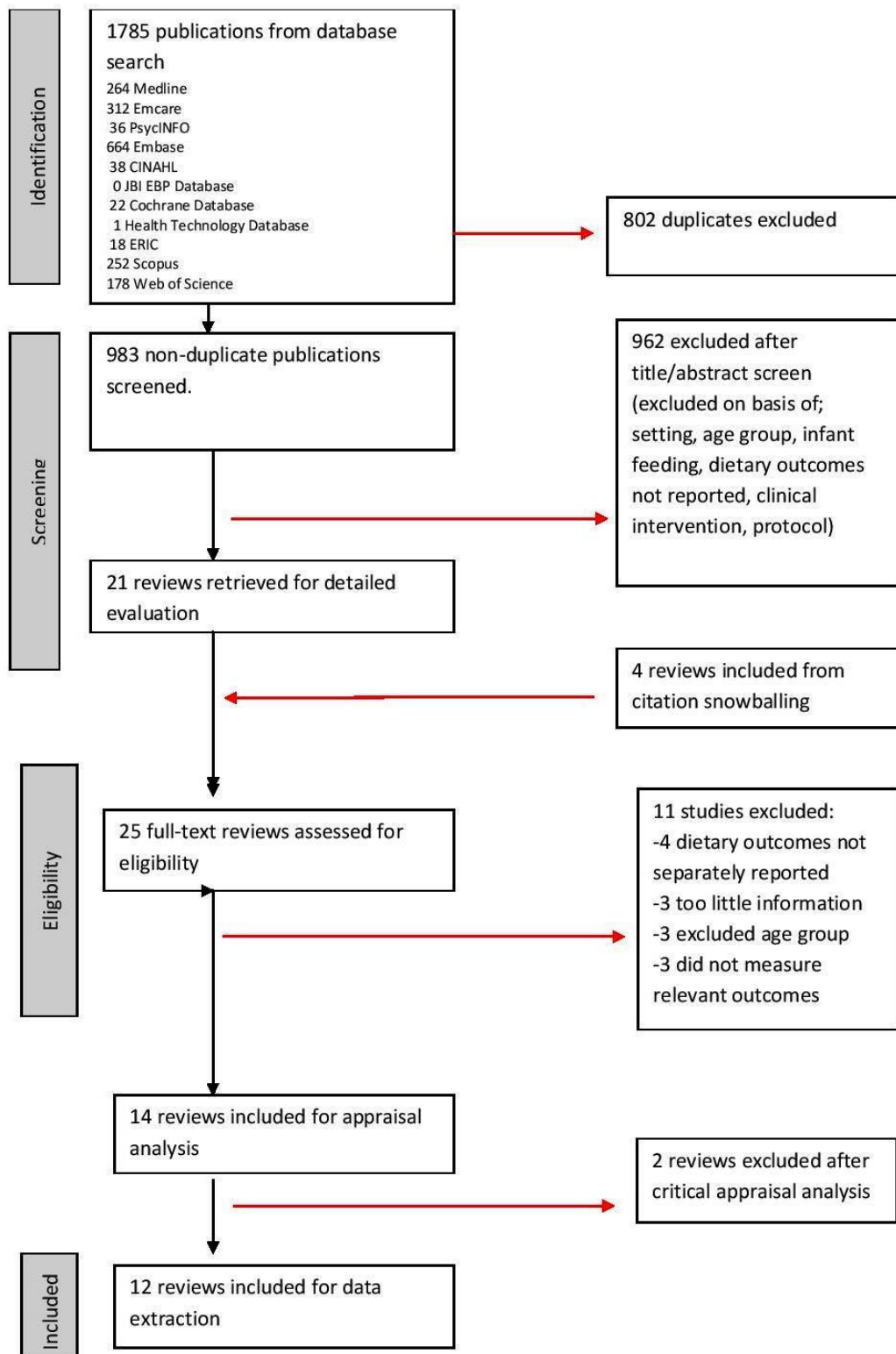


Figure 4-1: PRISMA flowchart of the selection process for systematic reviews



### 4.3.2 Description of Reviews

Twelve systematic reviews were included in the final review and the quality assessment ratings are tabulated in Table S2: Critical appraisal results for the included reviews in the Supplementary Materials (Appendix 5). The reviews met the 11-item validated JBI quality assessment criteria, except for five reviews where one or two criterion was not met or unclear, but these anomalies were judged not to warrant exclusion. In two reviews it was unclear if both the process of appraisal and data extraction was undertaken independently by two reviewers. In Sisson et al. (2016) criteria for appraising the studies were on purpose not included to ensure a broad inclusion of studies. In Hesketh & Campbell (2010), limitations for search selection was not justified but the included studies were consistent with other reviews. In Nixon et al. (2012), methods to minimize errors in data extraction were not reported.

Table 4-1 provides an overview of selected characteristics of the included reviews. Reviews included primary studies all post-2000 apart from six primary studies examined by Ward, Bélanger et al. (2015) and Ward, Welker et al. (2016). The total number of included primary studies which were unique was 101 and ranged from three [38] to 45 [54]. A relatively small number of primary studies were excluded by the reviewers (Table S3: Characteristics of included systematic reviews, listed in Appendix 6). Reasons for ineligibility of some of the primary studies were no dietary outcomes reported or settings such as schools and Family Day Care [39,53,57]. The total sample size of the studies included in the individual reviews ranged between 260 children [60] to more than 18,000 [53,57] and centres caring for between six [60] and more than 1050 children [61]. The majority of the primary studies were conducted in the USA with smaller numbers in other high-income countries including Australia, Israel, Europe (Switzerland, Germany, Belgium, France, Netherlands and Spain), UK, Asia and South America. Three primary studies were undertaken in high-middle income countries, China [62], Turkey [63] and Columbia [64].

**Table 4-1: Key Characteristics of the Selected Systematic Reviews**

Author/Date	Objectives Examined	Number of Primary Studies Included in Each Review/Total Number of Diet-Related Studies.  Participant Characteristics	Study Design	Key Findings of the Review	Overall Recommendations of the Review
Bell and Golley 2015	Effectiveness of nutrition promotion interventions on children’s dietary intake.	24/25  Children 0–5 years, providers and staff or parents of children, formal childcare	Prospective studies with or without a comparison group, outcomes measured at baseline and post intervention  4 RCT, 1 cross-over cluster-RCT, 8 CCT, 10 cohort, 1 cross-over, 1 cross-over quasi-experimental	ECS interventions can achieve changes in children’s dietary intake and associated social-environmental determinants.  DI: Significant effect on children’s dietary intake (8/11). Significant improvements in centres nutrition environment (6) including policy (2), nutrition best practices (3), nutritional quality of centres’ menus (3), parental food provision (4), child knowledge/attitudes/preferences (2), and staff knowledge/attitudes/behaviours (2).	ECS are potential settings for effective nutrition health promotion  Environmental interventions can achieve dietary improvements  Evaluate effect of nutrition environment changes on children’s dietary intake  Utilise age-appropriate behaviour change theory
Hesketh and Campbell 2010	Effectiveness of interventions to prevent obesity, promote healthy eating and/or physical activity or reduce sedentary behaviours.	3/9  Children 2–5 years, preschool/formal childcare	Experimental studies  2 cluster-RCT, 1 CCT	Achieved success in modifying outcomes of interest.  AN: Significantly lower BMI increases at 1 and 2 years follow up in one study. Two studies significant decrease in serum cholesterol but no change to height-weight ratio.  DI: Significant decrease in saturated fat and total fat in snacks, and corresponding reduction in intake in two studies	Add parental component. Build knowledge and skills of educators and parents  Consider SBT-based strategies  Build on existing research activities  Need cost-effective studies

Ling, Robbins et al. 2016	Effects of prevention and management interventions on overweight/obesity.	13/16 Children 2–5 years, formal childcare	Intervention studies with a sample >30 centres 13 cluster-RCT	Studies which combined diet with PA, had a significant effect on measures of BMI (6/13). Findings supported teaching preschool children with interactive education and their families with interactive education and behavioural therapy. Lack of parental involvement may account for limited success in all studies.	Build knowledge and skill capability of educators with education, and health-promoting component for educators.  Build HE capacity of both parents and children. Offer parents interactive education and nutrition-related behavioural therapy. Use age-appropriate interactive, hands-on experiences with children
Mikkelsen, Husby et al. 2014	Effectiveness of different strategies influencing children’s food choice at an early age.	26 studies Children 3–6 years, preschools/formal childcare	Intervention studies with baseline and follow-up measurements 11 RCT, 9 quasi RCT, 1 cross-over, 2 pre-post test design, 3 cluster-RCT	Comprehensive interventions more likely to succeed in behaviour change, especially when targeting children of low-income families. Multi-component programs which included education, changes to the centre environment, policy and involvement of parents were most effective.  DI: Significant increase in fruit and vegetable intake and in nutrition knowledge in relevant studies.  AN: No significant effect	More comprehensive interventions likely to be more successful i.e., multi-component and multi-level  Target disadvantaged groups  Add longer follow-up  Focus on implementation drivers and barriers to increase understanding of what makes an intervention work
Morris, Skouteris et al. 2014	How have parents been incorporated into ECEC childhood obesity interventions and to what extent, if any does their involvement impact the outcomes of the intervention?	12/15 Parents of children in preschools/formal childcare	Experimental studies 2 RCT, 6 cluster-RCT, 3 quasi-experimental, 1 prospective cohort	AN: Positive and significant weight changes in some studies (6/12). No changes in anthropometry in all studies despite change in parental and child knowledge and attitudes and child unhealthy-diet behaviours.  DI: Secondary outcome relating to healthy eating seen in most studies.	Build capacity of educators and parents  Increase educators’ role in parental engagement  Include collaborative parental involvement, including in curricula  Future research on collaborative parental involvement and effects

Nixon, Moore et al. 2012	Identify effective behavioural models and behaviour change strategies, underpinning preschool and school-based interventions aimed at preventing obesity.	4/9 Children 4–6 years, pre-schools/formal childcare	Intervention studies with before and after measures in the same children  plus follow-up of 6 months or longer  1 RCT, 3 cluster-RCT	Interventions that combined high levels of parental involvement, interactive learning plus targeted dietary change with long-term follow-up were most effective.  DI: significant favourable changes in dietary behaviours (4/4).  AN; significant favourable changes in intervention group (2/2).	Include BCS  Build children's (and parents) perceived competency to make dietary changes with education and modelling positive behaviours  Change centre-environment and measure impact  Ensure evidence-base driven by users involvement
Sisson, Krampe et al. 2016	Effectiveness and description of interventions that target obesogenic behaviours in child care centres.	45/71 Children 3–5 years, childcare settings	Experimental studies  22 RCT, 19 quasi-experimental or pre-post design, 3 natural experiments	DI: Most studies achieved a significant effect in at least one nutrition outcome (87% desired effect).	Multi-level (child, environment), multi-component  Focus on childcare environment including technical support and training  Include parental involvement  Include BCS e.g., SEM, SCT  Focus future research on RCT underpinned with BCT with emphasis on parental involvement  Measure environmental effects on child's dietary intake
Ward, Welker et al. 2016	Identify the most promising obesity prevention intervention characteristics associated with successful behavioural and/or anthropometric outcomes.	18/47 Children 2–6 years, early care and education centres	All study designs with pre- and post-evaluation using objective or validated measures  4 RCT, 4 cluster-RCT, 3 randomised cross-over trial, 6 pre-post design, 1 quasi-experimental trial	Tentative evidence that multi-component and multi-level ECS interventions with parental engagement are most likely to be effective.  AN: Healthy eating and parental involvement correlated with favourable anthropometric outcomes.  DI: Most studies showed at least one positive dietary effect. No correlations found between HE intervention strength (calculated by authors using own system) and HE outcomes, with or without parental engagement.	Comprehensive, multi-level  Stronger interventions with parental engagement and environmental and policy components  Research already-effective interventions  Explore whether comprehensiveness is negatively associated with feasibility and fidelity if educator led

Ward, Bélanger et al. 2015	Identify if childcare educators' practices are associated with pre-schoolers' physical activity and eating behaviours. Assess the effectiveness of interventions that control educators' practices or behaviours	5/15 Pre-schoolers, educators, childcare facilities	All types of quantitative studies, excluding multi-component interventions or studies focusing on more than educators.  1 cross-over RCT, 2 quasi-experimental, 2 pre-post design	Educators may play a positive role in promoting healthy eating behaviours in children.  DI: Significant, positive changes in dietary intake, particularly fruit and vegetables. Increased intake and acceptance of new or healthy food/snacks (5/5).	Educators have a crucial role in promoting HE behaviours in children  Involve peers as change agents for positive eating  Reassess interventions in today's changed environment, use diverse populations, use objective or validated measurements
Ward, Bélanger et al. 2016	Effectiveness of the relationship between pre-schoolers' eating behaviours and physical activity, and those of their peers.	7/13 Children 2–5 years, childcare centres	All types of quantitative studies  1 RCT, 3 pre-post design, 3 non-RCT	All nutrition interventions reported peers may influence eating behaviours. Social influences particularly modelling was a strong determinant of individual's food intake. Moderated by number of peers, age, gender, perceived personality of role models.  DI: Significant increase in targeted foods (7/7).	Use peers as agents for positive eating behaviours
Wolfenden, Jones et al. 2016	Effectiveness of strategies improving the implementation of policies, practices or programmes by childcare services that promote child healthy eating, physical activity and/or obesity prevention.	8/10 Children up to 5–6 years, centre-based childcare	Any study with a parallel control group that compared any strategy to improve the implementation of a healthy eating policy, practice or programme to no intervention, 'usual' practice or an alternative strategy and Included baseline.  1 RCT, 3 cluster-RCT, 2 quasi-experimental trial, 1 randomised CCT, 1 randomised parallel-group trial	No intervention improved the implementation of all policies and practices targeted by the implementation strategies relative to a comparison group. Most reported at least one favourable change to policies or practices (7/8).  DI: Significant positive changes in types of foods provided and foods selected. Consumed significantly less energy, fat, saturated fat compared to control in one study.  AN: Significant reduction in centre-level child adiposity compared to control in one study. No significant intervention effect in one study following menu changes.	Include institutional changes: policy, health promotion, education, staff training, curriculum  Assess cost-effectiveness  Use comprehensive theoretical frameworks to identify implementation barriers  Further determine barriers to implementation with formative research

---

					Include institutional changes: policies, age-appropriate health promoting education curricula, educators' training
Zhou, Emerson et al. 2014	Efficacy of childhood obesity interventions in childcare settings on outcomes of dietary intake, physical activity, and adiposity.	13/15  Children up to 5–6 years, preschool/ formal childcare	Any interventions with controlled study design  12 RCT-Cluster, 1 cluster controlled	Interventions variably effective in improving adiposity and dietary behaviours	Include cost-effectiveness studies  Research improving nutrition environments and target diverse populations  Use consistent outcome measures, validated or objective measurements  Add sufficient follow-up time

---

Abbreviations: AN anthropometrics; CCT controlled clinical trial; BCS behavioural change strategies; BCT behavioural change theory; BMI body mass index; DI dietary intake; ECEC Early Childhood Education and Care; ECS Early Childhood Service; HE healthy eating; PA physical activity; RCT randomised controlled trial; SBT social behavioural theory; SCT social cognitive theory; SEM social ecological model.

Most of the primary studies in all of the reviews were randomised control trials (RCT) or cluster-RCT followed by case-control trials or quasi-experimental studies (Table 1). Concerns about the quality of the evidence were raised in all of the reviews, particularly where dietary changes were the primary outcomes [57,58,61]. Based on the data reported in the 12 reviews, more than half rated at least 50% of the primary studies as weak [55,57,59,60] or having insufficient information to permit evaluation [52,56,61]. Three studies using COCHRane tools did not allocate a quality rating as there was a high-risk bias for at least one domain [38,56,61]. Only the review by Mikkelsen et al. (2015) rated 22 of the 26 primary studies as having a moderate or strong quality of evidence. The other four reviews rated the majority of the studies as moderate [38,39,53,54]. Implications are that results are uncertain and must be considered with caution. However, most of the studies were RCT or cluster RCT, which is a high level of evidence, and reviews were selected using rigorous quality assessment. Nevertheless, sample sizes of less than 30 centres, most of the studies being from the USA and studies with a high risk of bias because they were not RCT, may limit the generalisability of the results.

There was considerable heterogeneity between primary studies which precluded pooling of the data and meta-analysis or any systematic reviews undertaking Grading of Recommendations Assessment, Development and Evaluation (GRADE) [65]. Heterogeneity existed in studies' objectives (e.g., obesity-related physiological objectives, dietary-related objectives), how dietary-related outcomes were measured (e.g., self-reported dietary intake, 24 h-recall, plate wastage measurements) and level of intervention (e.g., individual-level with a focus on knowledge, attitude, beliefs; environmental-level with a focus on changes to food provision and policy, socio-cultural elements or both).

### 4.3.3 *Findings of the Reviews*

#### 4.3.3.1 Effectiveness

##### Dietary Intake

Study findings favoured dietary effectiveness in most of the included reviews (Table 1).

Assessed outcomes were all in the direction of nutritional improvement when measured for children's dietary intake and food choices. For those studies seeking to improve children's

eating habits, significant improvements in children's dietary intake was reported in eight reviews and included an increased intake in children's mean servings of fruit and or vegetables [56–58] as well as decreased intake of total fat and saturated fat [38,57,58]. Moreover, most reviews which included interventions which influenced centre food provision or parental provision of lunchboxes reported post-intervention improvements in the number and mean size servings of fruit and/or vegetable offered to children [56,57], fewer sweetened beverages [57] and fewer energy dense and nutrient poor (EDNP) foods [56,57]. No intervention improved the implementation of all policies and practices recommended to strengthen healthy eating environments and educator behaviours relative to a comparison group [61] but most reviews reported that primary studies had achieved a significant change in at least one measured variable specific to food groups such as fruit, vegetables or nutrients[54,55,61].

#### Weight Status

Seven reviews focused on obesity-prevention and obesogenic behaviours (including diet-related behaviours). Despite reporting significant effects on BMI and other measures of adiposity for some primary studies, review authors concluded overall that diet-related interventions did not have a consistently positive impact (Hesketh and Campbell, 2010; Nixon et al., 2012; Morris et al., 2014; Zhou et al., 2014; Ling et al., 2016; Sisson et al., 2016; Ward, Welker et al., 2016). Two other reviews reported no significant changes in weight status (Mikkelsen, Husby et al., 2014; Wolfenden, Jones et al., 2016). Ling, Robbins et al. (2016) and Zhou, Emerson et al. (2014) reported that the primary studies which significantly affected weight outcomes were multi-component interventions which addressed both dietary and physical activity behaviours. Mikkelsen, Husby et al. (2014) reported that single component interventions did not have a significant effect on children's fruit and vegetable intake but five of six multi-component interventions did. Actively involved and engaged parents were also associated with consistently positive impacts on children's weight status (Nixon, Moore et al., 2012; Sisson, Krampe et al., 2016).

#### Multi-Level Interventions



More positive outcomes were seen in reviews assessing interventions directed at both environmental- and individual-level determinants of healthy eating behaviours. Most effective were multi-level interventions targeting environmental-level determinants including implementation support [54,55,58,61]. Several reviews reported improvements in educators' nutrition knowledge and diet-related practices in intervention groups [57,58]. Interventions which focused on educators' practices at mealtime and children's eating behaviours also resulted in significant outcomes [59]. Similarly, children significantly influenced other pre-schoolers' food choices and food preferences through role modelling and observational learning, particularly with fruit and vegetables [60]. Children's knowledge also improved significantly following educational activities [53,57,58].

Three reviews reported that the strongest effects came from interventions targeting environmental-level determinants. Bell and Golley (2015) examined 13 primary studies, with 12 reporting significant improvement in the food provided in centres (through food policy and changes in educators' practices), the nutritional quality of menus and parental food provision of lunchboxes. Primary studies on interventions focusing on environmental-level factors reported positive outcomes including food and nutrition policies and the food environment, however few of these studies also reported on whether children's dietary intake had changed as a result [54]. Wolfenden, Jones et al. (2016) reported that interventions targeting the food environment were most successful but did not have a significant effect on other outcomes such as a child's diet or weight status.

#### Parental Involvement and Engagement

Half of the reviews reported an association between parental involvement and engagement, and achievement of objectives in ECEC interventions [38,52–55,58]. The classification of parental involvement as none, low or passive, moderate or active or high was different across the reviews. Parental involvement was typically classified as active if parents were involved in a component of the intervention, for example, an education program or hands-on experiences [39]. Intervention effects on children's anthropometry were weak and inconsistent but improved when involvement and engagement with parents occurred [53–55]. Using a custom-designed intervention intensity coding system, Ward, Welker et al. (2016) found that interventions with any parental engagement component significantly

added to the effectiveness of the ECEC intervention. Morris et al. (2014) found positive weight changes in six primary studies and improvements in healthy eating in most studies ( $n = 15$ ). Six primary studies attributed high parental engagement to the successful achievement of their primary outcome to effect changes in children's weight (cited in Morris et al. 2014).

#### 4.3.4 *Characteristics of Successful Interventions*

##### 4.3.4.1. Delivery of Interventions

Positive outcomes for healthy eating behaviours were mostly reported for interventions delivered by researchers or external experts [39,52,55,56]. All of the included primary studies in the review by Wolfenden, Jones et al. (2016) were externally-delivered by nurses, health service personnel, dietitians or other experts. A quarter of the primary studies were delivered by childcare educators in the review by Ward, Welker et al. (2016) and although there were fewer positive dietary-related outcomes there was no difference when anthropometric outcomes were compared with strategies delivered by external researchers. The most commonly used implementation strategies were staff group education and training sessions, written materials, the inclusion of nutrition-related activities in the childcare curriculum and food and nutrition policies [57].

##### 4.3.4.2. Behavioural Change Theories

Eight reviews reported the number of included primary studies which used a theoretical framework [39,52–54,56–58,61] and are reported in Table S4: Summary of the evidence from selected reviews (Appendix 6). The majority of reviews listed between a third and two-thirds of the primary studies as having a theoretical framework. The most common theoretical frameworks used were behavioural change theories (BCT) including the social ecological model (SEM) and social cognitive theory (SCT) or social learning theory (SLT). Theoretical frameworks used in fewer than two included primary studies were the: Health Belief Model, Social Determination Theory, Jajonc's mere-exposure theory of effect, Piaget's Developmental Theory, Multiple Intelligence Theory, a transtheoretical model for behavioural change and a capacity building model. Reviews which identified theoretical

underpinnings found that most of the studies were developed without considering theoretical models or frameworks [52,56,58,61]. Nixon et al. 2012 and Sisson et al. 2016, who examined any associations with theory and outcomes, found that studies that used SCT/SLT when developing an intervention had significant favourable outcomes in one or more outcomes and that there were a greater number of effective studies which utilised behavioural theory frameworks. Sisson et al. 2016 noted that 25 of the 29 theory-based dietary-related interventions were effective, however, all 14 non-theory based interventions were also somewhat effective.

#### 4.3.4.3. Characteristics of Interventions Involving Educators

Most of the dietary-related interventions targeted educators' behaviours and practices and included nutrition education and training sessions [57]. Educational interventions changed educators' knowledge [57,58], although Wolfenden, Jones et al. (2016) reported that knowledge was not significantly affected. Children's acceptance and intake of health-promoting foods increased if educators modelled healthy eating enthusiastically [57–60], used immediate positive verbal reinforcement and served fruit and vegetables in advance of other foods [59]. Using non-food rewards, encouraging 'try one more bite' and allowing children to self-select food was also effective [59]. Workplace interventions supporting educators' wellness and lifestyle also had promising results [54,57].

#### 4.3.4.4. Characteristics of Interventions Directly Involving Children

Effective interventions involving children included interactive educational activities as part of the childcare curriculum [39,52,54,57,58] and using children as role models [57–60]. Girls were more influential as role models for trying and consuming healthy foods for both genders and younger children were more influenced by watching older children as to what to eat [60]. Children also ate more in larger peer groups and tended to choose the same food as the previous child [60].

#### 4.3.4.5. Characteristics of Interventions Involving Parents.

Active parental involvement included participation in any intervention component such as receiving written material, receiving regular newsletters, attending education sessions or workshops, completing homework tasks, participating in curriculum planning or participating in interactive hands-on activities such as cooking, growing vegetables or similar activities, with their children [38,39,52–54,58,60]. Even ‘low’ participation of parents such as receiving written material was associated with more positive outcomes [38,39,52–55].

#### 4.3.5 *Review Recommendations*

Recommendations for practice and policy (Table 2) included: (1) underpinning intervention design with theoretical frameworks and effective behavioural change theory; (2) targeting intervention strategies at environmental-level and individual-level determinants with a multi-component, multi-level approach; (3) involving and engaging parents in intervention strategies; (4) building the capacity of educators, parents and of children. Successful training included goal setting and increased self-efficacy and self-regulation through feedback. Skill development was enhanced with role modelling and opportunities for observational learning.

Summarised recommendations for future research (Table 4-2) included building upon existing activities, including cost-effectiveness assessment in the evaluation, being driven by user involvement (educators, parents) and children’s views, measuring children’s dietary changes as well as environmental impact and having longer follow-up. Meta-analysis is required, with more high-quality randomised control trial (RCT) with larger sample sizes using validated measurement methods and tools.

**Table 4-2:** Summarised research and practice recommendations by review authors.

Research Recommendations	Author	Practice Recommendations	Author
Future research should build upon existing activities	[38,55]	ECS have potential as settings for effective nutrition promotion	[38,53,54,57,58,61]
Include cost-effectiveness	[38,56,61]	Underpin intervention design with effective social behavioural change theory (e.g., Social Ecological Model, Social Cognitive Theory)	[38,39,52–54,57,58]
Be driven by user involvement (educators, parents) and children’s views	[39,52,58]	Target intervention strategies at environmental-level and individual-level determinants. Successful outcomes are more likely with a multi-component, multi-level approach	[39,54–56,58,59]
Measure children’s dietary changes as well as environmental impact	[39,54,57]	Involve and engage parents in intervention strategies. Changes are more likely with high levels of parental engagement	[38,39,52–55]
Include formative research to (1) determine barriers to strategy implementation (2) identify implementation drivers and barriers to increase understanding of how interventions work	[56,58,61]	Build the capacity of educators, who also have a role in inviting parental participation	[38,52,53,56,59]
Have longer follow-up to allow for behavioural changes to have an impact and to measure longer-term outcomes	[39,56,58]	Build the capacity of parents and of children with educational, hands-on experiences	[39,52–54]
Include more high-quality RCT with larger sample sizes using validated measurements and tools.	[54,56,59,60]	Involve peers (children) as change agents for positive eating behaviours	[59,60]
Explore whether collaborative parental engagement effects change	[54,55]	Include institutional changes; policies, age-appropriate education curricula, educators’ training	[56,61]

Abbreviations: ECS early childhood services, RCT randomised control trial.

## 4.4 Discussion

This Umbrella review investigated the effectiveness of interventions to promote healthy eating in children aged 2–5 years attending centre-based childcare. The aim was to also identify characteristics of successful interventions and list and summarise the most frequent recommendations for policy, practice and research. Overall, 12 systematic reviews of acceptable methodological quality were included examining 101 primary studies.

#### 4.4.1 *Implications for Practice and Policy*

Despite the considerable heterogeneity, the review findings supported the proposition that interventions to promote healthy eating in children aged 2–5 years attending centre-based childcare are effective. Successful interventions were multi-component, multi-level targeting both environmental and individual-level determinants of healthy eating behaviours. Multi-component interventions included educational strategies, changes to the centre-environment and policy. These findings are consistent with the conclusions of other Umbrella reviews for other settings [13,66–68] and public health priorities [69,70]. Overall, institutional changes facilitated by policies, age-appropriate health promoting curricula and educators’ training were recommended [56,61]. Involving educators as role models and interventionalists may improve children’s dietary food patterns, particularly if educators are given professional development, training and ongoing technical support [52,58,61]. The key characteristics associated with successful outcomes are summarised in the textbox (Figure 4-2: List of summarised intervention characteristics).

<b>Centre environment</b>	
- include healthy eating policy supporting environment changes	- make fresh water, fruits and vegetables easily available
- modify the menu for meals and snacks	- train food preparers, modify food preparation procedures
	- include family-style meal service with fruit and vegetables served in advance
<b>Educator component</b>	
- provide educator training	- provide professional development and training of cooks
- ensure educators: role model HE and positive behaviours, use non-food rewards, encourage children to 'try one bite', enthusiastically model healthy eating (not silent modeling), give immediate positive verbal reinforcement for quality behaviours, not quantity	- provide ongoing technical support and educational visits from external experts
- allow children to self-select foods	- include in the training: children's nutritional requirements, healthy foods, handling food safety, nutrition policy, parent communication skills, food service/menu modification, and nutrition in the curriculum. Add increased self-efficacy and self-regulation through feedback: role modeling and opportunities for observational learning
- mix younger and older age groups at mealtimes. Possibly larger group sizes	- ensure continual educator-parent communication
<b>Child component</b>	
- provide structured, 'hands-on', interactive and age-appropriate educational nutritional activities (e.g. games with food themes, 'no-pressure' food tasting)	- provide interactive skill development sessions in food preparation, cooking, growing vegetables
<b>Parental component</b>	
- ensure purposeful involvement and engagement in policy and/or curriculum planning and project management	- inform parents on what is in the curriculum or being programmed
- provide consistent educational information across both settings	- offer 'hands-on' interactive cooking classes or doing activities with the children
- provide written material such as menus, recipes, nutrition policy, posters and nutrition information	- include in parent education: child nutrition, positive food parenting, children's healthy food choices, menu and recipe suggestions, food safety, special diets, food to send to childcare from home, what to pack in lunchboxes. Include behavioural change strategies such as weekly homework, goal setting, social support, parenting skills and increased self-efficacy and self-regulation through feedback
- provide education through e.g. newsletters, pamphlets, posters, take-home bags, online education, family functions, workshops, sessions with health professionals, tailored advice from questionnaire results	- ensure active involvement eg; encouraging children to drink water and engaging parents from planning stage to implementation
	- train parents as peer educators
<b>Duration</b>	
- frequent, and long-term	- >1 year, ideally 2-4 years

**Figure 4-2:** List of summarised multi-strategy, multi-level intervention characteristics.

A common recommendation in the reviews was to underpin intervention design with theoretical frameworks and effective behavioural change theories, ideally components of Social Cognitive Theory [71] alongside a social-ecological framework [72]. Wolfenden et al. 2016, suggest that if an intervention is developed using a comprehensive theoretical framework it would be more likely to be effective as it would address the theoretically identified barriers and facilitators. This aligns with the conclusions of most of the reviewers that multiple factors influence diet-related behaviours and require multiple strategies and levels of influence [73]. Consistent with the social-ecological model, interventions with the biggest impact focused on environmental changes such as menu modifications, policy and changes to food provision [38,57,61] coupled with technical support and training [54]. Multi-component approaches addressing the centre's environment as well as the inclusion of an educational component were more effective than education alone [58] and are consistent with findings in other settings [28,66].

#### *4.4.2 Evidence Gap*

The translation of changes in educators' knowledge, practices and centre environment to children's dietary behaviours was however not consistently observed [39,54]. Moreover, positive changes in weight status to prevent obesity through dietary-related interventions reported in the reviews were not always achieved. Positive changes in weight status were attributed to interventions which addressed both diet and physical activity [52,55,58] and also actively involved and engaged parents [39,54].

More studies assessing the dietary-related outcomes from involving and engaging with parents are required. Even small levels of parental involvement were associated with better weight status outcomes [38,39,52–55]. Parents were however rarely fully engaged [58]. Being fully involved included parents knowing what children were learning, participating in curriculum planning, attending nutrition education sessions and participating with hands-on interactive educational activities, with or without their children [39,52]. In the one primary study that measured the impact of parental involvement on child diet-outcomes [74], parental satisfaction was correlated with children's weight change. Parents who were satisfied with the program consumed fewer energy-dense nutrient-poor foods suggesting parental involvement and satisfaction could be linked with more effective outcomes.



More research is needed to understand the interactions between educators and parents and the impact of collaborative parental engagement. With many children spending time in childcare and the premise that all food preferences are learnt, educators' roles are crucial as very young children are dependent upon them not only to provide food but also to guide and shape their food preferences and dietary habits [75]. Qualitative studies have explored educators' perception of the influencers on children's diets [24,75–77] and identified the importance of parental involvement. Educators have a role in inviting parental participation and this, along with building the capacity of educators through technical support and training, was recommended by several reviewers [52,53,56,57,59]. Interventions are needed to build the confidence of educators to engage with and involve parents and extend key messages across the two settings.

The impact of nutrition-related strategies to build the capacity of children is also an evidence gap. Findings emphasized the importance of targeting children with interactive education and hands-on experiences which are age-appropriate [39,52]. This is consistent with recent studies that these interventions influence children's food preferences and readiness to try new foods [78]. Nixon et al. (2014) further recommended that the interventions should be informed by children's knowledge and behaviours and the impact of this and age-appropriate education is a recommended area of emerging research.

The impact of nutrition-related interventions and practices on children from low socio-economic areas is of particular interest. Many of the primary studies were directed at centres in low socio-economic areas or centres with a high proportion of children from disadvantaged families. The outcomes suggest that interventions supporting these populations could help reduce health inequalities [58]. This observation is similar to findings from diet-related studies in other low-income settings [79] and supports the call for focusing efforts in this area although results for pre-schoolers was modest but promising [79].

Missing from this Umbrella review was evidence of the sustainability of dietary-related interventions as few primary studies were implemented for more than a year and/or outcomes measured after the intervention. The recommended duration is at least one year, ideally 1–2 years [56,58]. Notable exceptions to this were the Head Start and Healthy Start

programs in preschools for socioeconomically disadvantaged children in the United States [80–86] and a program of limited interventions in China, Germany, France, Belgium, Spain and Australia [62,87–93]. Interventions need to be of a duration with follow-ups that allow enough time for changes to take effect [56,58]. This is a gap for future research as is the impact of the comprehensiveness (intervention complexity) of interventions.

Although the more comprehensive the intervention, the more likely it is to be successful, comprehensiveness may affect feasibility and fidelity negatively and warrants further exploration. Ward, Welker et al. (2016) found an inverse relationship between comprehensiveness and positive outcomes. Furthermore, in an Umbrella review investigating community-based interventions promoting healthy eating and physical activity, multi-component interventions were not correlated with positive outcomes [70]. Moreover, most of the primary studies in this Umbrella review were externally delivered and the results not replicated when delivered by educators. It is not unusual for the effectiveness of interventions to be lost when it is adapted for the local context in the non-research setting [94]. The translation of knowledge and evidence-based recommendations into practice is a universal challenge for researchers, practitioners and policymakers [95]. Formative and qualitative research is therefore needed to understand the local context, determine barriers to strategy implementation and focus on implementation drivers and barriers to increase understanding of how interventions work [56,58,61]. This would enable the involvement of the users (educators, parents) to more fully, incorporate children's views and provide the engagement needed for more sustainable as well as effective outcomes.

Lastly, reviewers recommended that cost-effective studies be undertaken [38,56,61]. Lifestyle interventions are likely to be cost-effective for pre-schoolers [96] and childhood obesity is associated with excess healthcare expenditure [97].

#### *4.4.3 Limitations of the Studies*

Based on the data reported in the 12 reviews, reviewers cautioned that many primary studies were rated as weak or having insufficient information to permit evaluation. The actual effect of the intervention may therefore be smaller than the effects reported because

of the low quality of reporting [98] and generalizing the results needs to be used cautiously. Although more RCT with larger samples sizes are called for, the nature of original studies in the real-world environment of ECEC settings, however, means that they are not feasible. A more pragmatic research approach is needed [99] focusing on existing activities. By combining quantitative and qualitative research into the same investigation, qualitative research can be used to confirm the quantitative findings and explore how evidence can be translated into practice more effectively [99]. If the primary studies were designed to be more homogenous, data could be pooled and examined using GRADE which does not categorize studies as weak because they are not RCT.

#### *4.4.4. Limitations and Strengths of the Umbrella Review*

Some of the challenges identified by Pollock et al. (2017) and Ballard & Montgomery (2017) in their critique of the robustness of Umbrella reviews were encountered in this study. These challenges included primary studies overlapping between reviews and appearing in more than one review, and a mismatch between the scope of the systematic review being examined and the research question of the Umbrella review. Seven of the 12 reviews had a remit for obesity prevention rather than healthy eating as a primary outcome. Furthermore, the heterogeneity of the reviews and the assessment of insufficient information in three reviews precluded an evaluation of the quality of the research through the use of GRADE. This was compounded by the difficulty for the systematic reviews to apply GRADE or a meta-analysis for the same reason. To address these challenges, the primary studies which appeared in more than one review were identified and the extent of overlap considered. Moreover, in the data extraction stage, within these accepted reviews, only primary studies which met the scope of the Umbrella review were included, strengthening confidence in the findings. Mapping the overlapping primary studies reassured the authors that the search strategies were thorough and demonstrated consistency between reviewers. To further ensure methodological strength, the scope of the Umbrella review was limited to only those reviews where diet-related behaviours and measures were reported separately, PRISMA guided the search strategy and two validated tools were used to assess the quality and risk of bias of the reviews and to standardize data extraction [33]. The consistency of the

findings and recommendations between the reviews supported the justification of this process. Similar to the findings by Pollock et al. (2017) this Umbrella review was able to identify evidence gaps and meet its objectives.

#### 4.5. Conclusions

Interventions promoting healthy eating positively influence children's dietary food patterns. Although environmental-level and individual-level determinants of healthy eating are impacted by centre-based interventions, these effects are not consistently translated to changes in children's diet-related behaviours or anthropometrics as a measure of preventing obesity. Positive outcomes can be further strengthened with parental involvement and engagement, and multi-level, multi-component strategies are recommended. Comprehensiveness may, however, affected feasibility and fidelity negatively when enacted by end-users; therefore, studies on existing interventions implemented by end-users are recommended. Meta-analysis and stronger study designs are called for but are often not feasible in the real world of childcare. Therefore, the translation of research or expert-led interventions into practice warrants further qualitative exploration of implementation drivers and barriers with end-users. This understanding and end-user involvement may contribute to the sustainability of interventions which is rarely reported.

The summarised findings and recommendations from this Umbrella review can inform child-health directed policies and practices. Based on the evidence, public health effort is warranted to support healthy eating interventions and practices in centre-based childcare. By incorporating multi-level and multi-component interventions into routine practices and extending this across the home and childcare setting, healthy food preferences and dietary-related behaviours can be influenced. More successful interventions require high levels of parental engagement, the use of behaviour change strategies and a focus on building the capacity of educators, children and parents.

**Supplementary Materials:** The following are available online at [www.mdpi.com/link](http://www.mdpi.com/link), Table S1: Record of search strategies, Table S2: Critical appraisal results for the included reviews using 11 critical appraisal criteria (The Johanna Briggs Institute, 2014), Table S3: Characteristics of included systematic reviews (using JBI Data Extraction Form for Systematic Reviews and Research Syntheses, Aromataris et al., 2015, The Johanna Briggs Institute

2014), Table S4: Summary of the evidence from selected reviews using the JBI data extraction checklist (The Johanna Briggs Institute, 2014), Figure S1: PRISMA flowchart of the selection process for systematic reviews.

## References

1. Birch LL, Anzman SL: **Learning to Eat in an Obesogenic Environment: A Developmental Systems Perspective on Childhood Obesity**. *Child Development Perspectives* 2010, **4**(2):138-143.
2. Lien N, Lytle LA, Klepp KI: **Stability in consumption of fruit, vegetables, and sugary foods in a cohort from age 14 to age 21**. *Preventive medicine* 2001, **33**(3):217-226.
3. Mikkila V, Rasanen L, Raitakari OT, Pietinen P, Viikari J: **Consistent dietary patterns identified from childhood to adulthood: the cardiovascular risk in Young Finns Study**. *The British journal of nutrition* 2005, **93**(6):923-931.
4. Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C, Mullany EC, Biryukov S, Abbafati C, Abera SF *et al*: **Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study 2013**. *Lancet* 2014.
5. Lee JM, Pilli S, Gebremariam A, Keirns CC, Davis MM, Vijan S, Freed GL, Herman WH, Gurney JG: **Getting heavier, younger: trajectories of obesity over the life course**. *International journal of obesity* 2010, **34**(4):614-623.
6. Hayes A, Chevalier A, D'Souza M, Baur L, Wen LM, Simpson J: **Early childhood obesity: Association with healthcare expenditure in Australia**. *Obesity (Silver Spring, Md)* 2016, **24**(8):1752-1758.
7. Russell-Mayhew S, McVey G, Bardick A, Ireland A: **Mental health, wellness, and childhood overweight/obesity**. *Journal of obesity* 2012, **2012**:281801.
8. Di Angelantonio E, Bhupathiraju SN, Wormser D, Gao P, Kaptoge S, de Gonzalez AB, Cairns BJ, Huxley R, Jackson CL, Joshy G *et al*: **Body-mass index and all-cause mortality: individual-participant-data meta-analysis of 239 prospective studies in four continents**. *The Lancet* 2016, **388**(10046):776-786.
9. Gortmaker SLP, Taveras EMM, DMPH: **Who Becomes Obese during Childhood -- Clues to Prevention**. *The New England journal of medicine* 2014, **370**(5):475-476.
10. Sabin MA, Kiess W: **Childhood obesity: Current and novel approaches**. *Best Practice & Research Clinical Endocrinology & Metabolism* 2015, **29**(3):327-338.
11. Verschuur M FN, Greenwell F, Raj T, Stein C, World Health Organisation.: **The European Health Report 2015 - targets and beyond - reaching new frontiers in evidence**. Copenhagen: WHO Regional Office for Europe; 2015.
12. World Health Organization: **Report of the commission on ending childhood obesity. 2016**. In.; 2016.
13. Cauchi D, Glonti K, Petticrew M, Knai C: **Environmental components of childhood obesity prevention interventions: an overview of systematic reviews**. *Obesity reviews : an official journal of the International Association for the Study of Obesity* 2016, **17**(11):1116-1130.
14. Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, Armstrong R, Prosser L, Summerbell CD: **Interventions for preventing obesity in children**. *The Cochrane database of systematic reviews* 2011(12):CD001871.
15. Corcoran L, and Steinley, K. : **Early Childhood Program Participation, From the National Household Education Surveys Program of 2016 (NCES 2017-101)**. In.: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.; 2017.

16. Australian Bureau Statistics: **ABS 4402.0 - Childhood Education and Care, Australia, June 2014**. In. Canberra: Australian Bureau Statistics; 2014.
17. Organisation for Economic Co-operation and Development (OECD): **PF4.1: Typology of childcare and early education services**. In. Edited by Social Policy Division - Directorate of Employment LaSA; 2016.
18. Sinha M: **Spotlight on Canadians: Results from the General Social Survey—Child care in Canada**. In. Ottawa. canada: Social and Aboriginal Statistical Division; 2014.
19. Organisation for Economic Co-operation and Development (OECD): **PF3.2: Enrolment in childcare and pre-school**. In. Edited by Social Policy Division - Directorate of Employment LaSA; 2016.
20. Mikkelsen BE: **Images of foodscapes: Introduction to foodscape studies and their application in the study of healthy eating out-of-home environments**. *Perspectives in public health* 2011, **131**(5):209-216.
21. Birch LL, Doub AE: **Learning to eat: birth to age 2 y**. *The American journal of clinical nutrition* 2014, **99**(3):723S-728S.
22. Peters J, Parletta N, Campbell K, Lynch J: **Parental influences on the diets of 2- to 5-year-old children: Systematic review of qualitative research**. *Journal of Early Childhood Research* 2014, **12**(1):3-19.
23. Larson N, Ward DS, Neelon SB, Story M: **What role can child-care settings play in obesity prevention? A review of the evidence and call for research efforts**. *Journal of the American Dietetic Association* 2011, **111**(9):1343-1362.
24. Mazarello Paes V, Ong KK, Lakshman R: **Factors influencing obesogenic dietary intake in young children (0–6 years): systematic review of qualitative evidence**. *BMJ open* 2015, **5**(9).
25. Steenbock B, Pischke CR, Schonbach J, Pottgen S, Brand T: **[The effectiveness of primary prevention interventions promoting physical activity and healthy eating in preschool children : A review of reviews]**. *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz* 2015, **58**(6):609-619.
26. Cliff DP, Hesketh KD, Vella SA, Hinkley T, Tsiros MD, Ridgers ND, Carver A, Veitch J, Parrish AM, Hardy LL *et al*: **Objectively measured sedentary behaviour and health and development in children and adolescents: systematic review and meta-analysis**. *Obesity Reviews* 2016, **17**(4):330-344.
27. Li L, Zhang S, Huang Y, Chen K: **Sleep duration and obesity in children: A systematic review and meta-analysis of prospective cohort studies**. *Journal of paediatrics and child health* 2017, **53**(4):378-385.
28. Gori D, Guaraldi F, Cinocca S, Moser G, Rucci P, Fantini MP: **Effectiveness of educational and lifestyle interventions to prevent paediatric obesity: systematic review and meta-analyses of randomized and non-randomized controlled trials**. *Obesity Science & Practice* 2017, **3**(3):235-248.
29. Osei-Assibey G, Dick S, Macdiarmid J, Semple S, Reilly JJ, Ellaway A, Cowie H, McNeill G: **The influence of the food environment on overweight and obesity in young children: a systematic review**. *BMJ open* 2012, **2**(6).
30. Erinosh TO, Hales DP, McWilliams CP, Emunah J, Ward DS: **Nutrition policies at child-care centers and impact on role modeling of healthy eating behaviors of caregivers**. *Journal of the Academy of Nutrition and Dietetics* 2012, **112**(1):119-124.
31. Bastian H, Glasziou P, Chalmers I: **Seventy-five trials and eleven systematic reviews a day: how will we ever keep up?** *PLoS Med* 2010, **7**(9):e1000326.
32. Hartling L, Chisholm A, Thomson D, Dryden DM: **A descriptive analysis of overviews of reviews published between 2000 and 2011**. *PloS one* 2012, **7**(11):e49667.
33. Aromataris, E., Fernandez, R., Godfrey, C., Holly, C., Kahlil, H. *et al*: **Summarizing systematic reviews:methodological development, conduct and reporting of an Umbrella review approach**. *Int J Evid Based Healthc* 2015, **13**(3):132-140.

34. Onishi A, Furukawa TA: **State-of-the-Art Reporting**. In: *Umbrella Reviews: Evidence Synthesis with Overviews of Reviews and Meta-Epidemiologic Studies*. edn. Edited by Biondi-Zoccai G. Cham: Springer International Publishing; 2016: 189-202.
35. Ballard M, Montgomery P: **Risk of bias in overviews of reviews: a scoping review of methodological guidance and four-item checklist**. *Research synthesis methods* 2017, **8**(1):92-108.
36. Pollock A, Campbell P, Brunton G, Hunt H, Estcourt L: **Selecting and implementing overview methods: implications from five exemplar overviews**. *Systematic reviews* 2017, **6**(1):145.
37. Organisation for Economic Co-operation and Development (OECD): **Country Classification**. In.: OECD; 2017.
38. Hesketh KD, Campbell KJ: **Interventions to prevent obesity in 0-5 year olds: an updated systematic review of the literature**. *Obesity (Silver Spring, Md)* 2010, **18** Suppl 1:S27-35.
39. Nixon CA, Moore HJ, Douthwaite W, Gibson EL, Vogege C, Kreichauf S, Wildgruber A, Manios Y, Summerbell CD, ToyBox-study g: **Identifying effective behavioural models and behaviour change strategies underpinning preschool- and school-based obesity prevention interventions aimed at 4–6-year-olds: a systematic review**. *Obesity Reviews* 2012, **13**:106-117.
40. Johanna Briggs Institute: **Joanna Briggs Institute Reviewers' Manual: 2014 edition / Supplement**. In: *Johanna Briggs Institute Reviewers Manual 2014 Methodology for JBI Umbrella Reviews*. vol. Appendix 3. Australia: Johanna Briggs Institute; 2014: 34.
41. Campbell KJ, Hesketh KD: **Strategies which aim to positively impact on weight, physical activity, diet and sedentary behaviours in children from zero to five years. A systematic review of the literature**. *Obesity Reviews* 2007, **8**(4):327-338.
42. Connelly JB: **Evaluating complex public health interventions: theory, methods and scope of realist enquiry**. *Journal of evaluation in clinical practice* 2007, **13**(6):935-941.
43. D'Onise K, Lynch JW, Sawyer MG, McDermott RA: **Can preschool improve child health outcomes? A systematic review**. *Social science & medicine* 2010, **70**(9):1423-1440.
44. Pearson N, Biddle SJ: **Sedentary behavior and dietary intake in children, adolescents, and adults. A systematic review**. *American journal of preventive medicine* 2011, **41**(2):178-188.
45. Bond M, Wyatt K, Lloyd J, Taylor R: **Systematic review of the effectiveness of weight management schemes for the under fives**. *Obesity reviews : an official journal of the International Association for the Study of Obesity* 2011, **12**(4):242-253.
46. Hendrie GA, Brindal E, Corsini N, Gardner C, Baird D, Golley RK: **Combined Home and School Obesity Prevention Interventions for Children: What Behavior Change Strategies and Intervention Characteristics Are Associated With Effectiveness?** *Health Education & Behavior* 2012, **39**(2):159-171.
47. Monasta L, Batty GD, Macaluso A, Ronfani L, Lutje V, Bavcar A, van Lenthe FJ, Brug J, Cattaneo A: **Interventions for the prevention of overweight and obesity in preschool children: a systematic review of randomized controlled trials**. *Obesity Reviews* 2011, **12**(5):e107-e118.
48. Summerbell CD, Moore HJ, Vögele C, Kreichauf S, Wildgruber A, Manios Y, Douthwaite W, Nixon CA, Gibson EL, ToyBox-study g: **Evidence-based recommendations for the development of obesity prevention programs targeted at preschool children**. *Obesity Reviews* 2012, **13**:129-132.
49. Swyden K, Sisson SB, Lora K, Castle S, Copeland KA: **Association of childcare arrangement with overweight and obesity in preschool-aged children: a narrative review of literature**. *Int J Obes* 2017, **41**(1):1-12.
50. Ward S, Belanger M, Donovan D, Horsman A, Carrier N: **Correlates, determinants, and effectiveness of childcare educators' practices and behaviours on preschoolers' physical activity and eating behaviours: a systematic review protocol**. *Systematic reviews* 2015, **4**:18.

51. Wolfenden L, Wyse RJ, Britton BI, Campbell KJ, Hodder RK, Stacey FG, McElduff P, James EL: **Interventions for increasing fruit and vegetable consumption in children aged 5 years and under.** *The Cochrane database of systematic reviews* 2012, **11**:CD008552.
52. Ling J, Robbins LB, Wen F: **Interventions to prevent and manage overweight or obesity in preschool children: A systematic review.** *International journal of nursing studies* 2016, **53**:270-289.
53. Morris H, Skouteris H, Edwards S, Rutherford L: **Obesity prevention interventions in early childhood education and care settings with parental involvement: a systematic review.** *Early Child Development and Care* 2014, **185**(8):1283-1313.
54. Sisson SB, Krampe M, Anundson K, Castle S: **Obesity prevention and obesogenic behavior interventions in child care: A systematic review.** *Preventive medicine* 2016, **87**:57-69.
55. Ward DS, Welker E, Choate A, Henderson KE, Lott M, Tovar A, Wilson A, Sallis JF: **Strength of obesity prevention interventions in early care and education settings: A systematic review.** *Preventive medicine* 2016.
56. Zhou YE, Emerson JS, Levine RS, Kihlberg CJ, Hull PC: **Childhood Obesity Prevention Interventions in Childcare Settings: Systematic Review of Randomized and Nonrandomized Controlled Trials.** *American Journal of Health Promotion* 2014, **28**(4):e92-e103.
57. Bell LK, Golley RK: **Interventions for improving young children's dietary intake through early childhood settings : a systematic review.** *International journal of child health and nutrition* 2015, **4**(1):14-32.
58. Mikkelsen MV, Husby S, Skov LR, Perez-Cueto FJ: **A systematic review of types of healthy eating interventions in preschools.** *Nutrition journal* 2014, **13**:56.
59. Ward S, Bélanger M, Donovan D, Carrier N: **Systematic review of the relationship between childcare educators' practices and preschoolers' physical activity and eating behaviours.** *Obesity Reviews* 2015, **16**(12):1055-1070.
60. Ward SA, Bélanger MF, Donovan D, Carrier N: **Relationship between eating behaviors and physical activity of preschoolers and their peers: a systematic review.** *International Journal of Behavioral Nutrition and Physical Activity* 2016, **13**(1):50.
61. Wolfenden L, Jones J, Williams CM, Finch M, Wyse RJ, Kingsland M, Tzelepis F, Wiggers J, Williams AJ, Seward K *et al*: **Strategies to improve the implementation of healthy eating, physical activity and obesity prevention policies, practices or programmes within childcare services.** *The Cochrane database of systematic reviews* 2016, **10**:CD011779.
62. Hu C, Ye D, Li Y, Huang Y, Li L, Gao Y, Wang S: **Evaluation of a kindergarten-based nutrition education intervention for pre-school children in China.** *Public Health Nutr* 2010, **13**(2):253-260.
63. Başkale H, Bahar Z: **Outcomes of nutrition knowledge and healthy food choices in 5- to 6-year-old children who received a nutrition intervention based on Piaget's theory.** *Journal for Specialists in Pediatric Nursing* 2011, **16**(4):263-279.
64. Céspedes J, Briceño G, Farkouh ME, Vedanthan R, Baxter J, Leal M, Boffetta P, Woodward M, Hunn M, Dennis R *et al*: **Targeting Preschool Children to Promote Cardiovascular Health: Cluster Randomized Trial.** *The American Journal of Medicine* 2013, **126**(1):27-35.e23.
65. Guyatt GH, Mills EJ, Elbourne D: **In the Era of Systematic Reviews, Does the Size of an Individual Trial Still Matter? (The PLoS Medicine Debate).** *PLoS Medicine* 2008, **5**(1):e4.
66. Bleich SN, Segal J, Wu Y, Wilson R, Wang Y: **Systematic review of community-based childhood obesity prevention studies.** *Pediatrics* 2013, **132**(1):e201-210.
67. Guerra PH, da Silveira JA, Salvador EP: **Physical activity and nutrition education at the school environment aimed at preventing childhood obesity: evidence from systematic reviews.** *Jornal de pediatria* 2016, **92**(1):15-23.
68. Safron M, Cislak A, Gaspar T, Luszczynska A: **Effects of School-based Interventions Targeting Obesity-Related Behaviors and Body Weight Change: A Systematic Umbrella Review.** *Behavioral Medicine* 2011, **37**(1):15-25.



69. Biddle SJH, Atkin AJ, Cavill N, Foster C: **Correlates of physical activity in youth: a review of quantitative systematic reviews.** *International Review of Sport and Exercise Psychology* 2011, **4**(1):25-49.
70. Brand T, Pischke CR, Steenbock B, Schoenbach J, Poettgen S, Samkange-Zeeb F, Zeeb H: **What works in community-based interventions promoting physical activity and healthy eating? A review of reviews.** *International journal of environmental research and public health* 2014, **11**(6):5866-5888.
71. Bandura A: **Health Promotion by Social Cognitive Means.** *Health Education & Behavior* 2004, **31**(2):143-164.
72. Sallis J, Fisher E, Owen N. **Ecological Models of Health Behaviour.** In: *Health behavior and health education: theory, research, and practice* Editors: Glanz, Karen, Rimer, Barbara K., Viswanath, K. 4th edition.; 2008: 465-485
73. McPherson K KP, Butland B, Jebb S, Thomas S et al. **Tackling Obesities: Future Choices-Project Report.** In.: 2nd Edition. Government; Office of Science.; 2007.
74. Natale RA, Messiah SE, Asfour L, Uhlhorn SB, Delamater A, Arheart KL: **Role modeling as an early childhood obesity prevention strategy: effect of parents and teachers on preschool children's healthy lifestyle habits.** *Journal of developmental and behavioral pediatrics : JDBP* 2014, **35**(6):378-387.
75. Lynch M, Batal M: **Factors Influencing Childcare Providers' Food and Mealtime Decisions: An Ecological Approach.** *Child Care in Practice* 2011, **17**(2):185-203.
76. Ray C, Määttä S, Lehto R, Roos G, Roos E: **Influencing factors of children's fruit, vegetable and sugar-enriched food intake in a Finnish preschool setting – Preschool personnel's perceptions.** *Appetite* 2016, **103**:72-79.
77. Otten JJ, Hirsch T, Lim C: **Factors Influencing the Food Purchases of Early Care and Education Providers.** *Journal of the Academy of Nutrition and Dietetics* 2017, **117**(5):725-734.
78. Gerritsen S: **Nutrition education for early childhood managers, teachers and nursery cooks: a prerequisite for effective obesity prevention.** *Public health* 2016, **140**:56-58.
79. Laws R, Campbell KJ, van der Pligt P, Russell G, Ball K, Lynch J, Crawford D, Taylor R, Askew D, Denney-Wilson E: **The impact of interventions to prevent obesity or improve obesity related behaviours in children (0–5 years) from socioeconomically disadvantaged and/or indigenous families: a systematic review.** *BMC public health* 2014, **14**:779.
80. Fitzgibbon ML, Stolley MR, Schiffer L, Kong A, Braunschweig CL, Gomez-Perez SL, Odoms-Young A, Van Horn L, Christoffel KK, Dyer AR: **Family-based hip-hop to health: Outcome results.** *Obesity* 2013, **21**(2):274-283.
81. Fitzgibbon ML, Stolley MR, Schiffer L, Van Horn L, KauferChristoffel K, Dyer A: **Two-year follow-up results for Hip-Hop to Health Jr.: A randomized controlled trial for overweight prevention in preschool minority children.** *The Journal of Pediatrics* 2005, **146**(5):618-625.
82. Fitzgibbon ML, Stolley MR, Schiffer L, Van Horn L, KauferChristoffel K, Dyer A: **Hip-Hop to Health Jr. for Latino preschool children.** *Obesity (Silver Spring, Md)* 2006, **14**(9):1616-1625.
83. Fitzgibbon ML, Stolley MR, Schiffer LA, Braunschweig CL, Gomez SL, Van Horn L, Dyer AR: **Hip-Hop to Health Jr. Obesity Prevention Effectiveness Trial: postintervention results.** *Obesity (Silver Spring, Md)* 2011, **19**(5):994.
84. Kong A, Buscemi J, Stolley MR, Schiffer LA, Kim Y, Braunschweig CL, Gomez-Perez SL, Blumstein LB, Van Horn L, Dyer AR et al: **Hip-Hop to Health Jr. Randomized Effectiveness Trial: 1-Year Follow-up Results: 1-Year Follow-up Results.** *American journal of preventive medicine* 2016, **50**(2):136-144.
85. Williams CL, Bollella MC, Strobino BA, Spark A, Nicklas TA, Tolosi LB, Pittman BP: **“Healthy-Start”: Outcome of an Intervention to Promote a Heart Healthy Diet in Preschool Children.** *Journal of the American College of Nutrition* 2002, **21**(1):62-71.

86. Williams CL, Strobino BA, Bollella M, Brotanek J: **Cardiovascular Risk Reduction in Preschool Children: The “Healthy Start” Project.** *Journal of the American College of Nutrition* 2004, **23**(2):117-123.
87. Bayer O, Von Kries R, Strauss A, Mitschek C, Toschke AM, Hose A, Koletzko BV: **Short- and mid-term effects of a setting based prevention program to reduce obesity risk factors in children: A cluster-randomized trial.** *Clinical Nutrition* 2009, **28**(2):122-128.
88. Bell AC, Davies L, Finch M, Wolfenden L, Francis JL, Sutherland R, Wiggers J: **An implementation intervention to encourage healthy eating in centre-based child-care services: impact of the Good for Kids Good for Life programme.** *Public health nutrition* 2015, **18**(9):1610-1619.
89. De Bock F, Breitenstein L, Fischer JE: **Positive impact of a pre-school-based nutritional intervention on children's fruit and vegetable intake: results of a cluster-randomized trial.** *Public health nutrition* 2012, **15**(3):466-475.
90. De Coen V, De Bourdeaudhuij I, Vereecken C, Verbestel V, Haerens L, Huybrechts I, Van Lippevelde W, Maes L: **Effects of a 2-year healthy eating and physical activity intervention for 3-6-year-olds in communities of high and low socio-economic status: the POP (Prevention of Overweight among Pre-school and school children) project.** *Public health nutrition* 2012, **15**(9):1737.
91. Peñalvo J, Santos-Beneit G, Sotos-Prieto M, Martínez R, Rodríguez C, Franco M, López-Romero P, Pocock S, Redondo J, Fuster V: **A cluster randomized trial to evaluate the efficacy of a school-based behavioral intervention for health promotion among children aged 3 to 5.** *BMC public health* 2013, **13**(1).
92. Puder JJ, Marques-Vidal P, Schindler C, Zahner L, Niederer I, Bürgi F, Ebenegger V, Nydegger A, Kriemler S: **Effect of multidimensional lifestyle intervention on fitness and adiposity in predominantly migrant preschool children (Ballabeina): cluster randomised controlled trial.** *BMJ (Clinical research ed)* 2011, **343**:d6195.
93. Zask A, Adams JK, Brooks LO, Hughes DF: **Tooty Fruity Veggie: an obesity prevention intervention evaluation in Australian preschools.** *Health Promotion Journal of Australia* 2012, **23**(1):10-15.
94. Milat A, Newsom R, King L, Rissel C, Wolfenden L, Bauman A, Redman S, Giffin M: **A guide to scaling up population health interventions.** *Public Health Research & Practice* 2016.
95. O'Reilly SL: **Translational research: The ingredients are only the start of the recipe for better dietetic practice.** *Nutrition & Dietetics* 2016, **73**(4):307-311.
96. Hollingworth W, Hawkins J, Lawlor DA, Brown M, Marsh T, Kipping RR: **Economic evaluation of lifestyle interventions to treat overweight or obesity in children.** *International journal of obesity* 2012, **36**(4):559.
97. John J, Wolfenstetter SB, Wenig CM: **An economic perspective on childhood obesity: Recent findings on cost of illness and cost effectiveness of interventions.** *Nutrition* 2012, **28**(9):829-839.
98. Moher D, Pham B, Jones A, Cook DJ, Jadad AR, Moher M, Tugwell P, Klassen TP: **Does quality of reports of randomised trials affect estimates of intervention efficacy reported in meta-analyses?** *The Lancet* 1998, **352**(9128):609-613.
99. Onwuegbuzie AJ, Leech NL: **On Becoming a Pragmatic Researcher: The Importance of Combining Quantitative and Qualitative Research Methodologies.** *International Journal of Social Research Methodology* 2005, **8**(5):375-387.

## 5 Chapter Five: Factors Influencing Nutrition-related Practices and Environments in Centre-based Child Care Settings: Childcare Providers' Perspectives

The previous study described in Chapter Four was a review of systematic reviews that examined the effectiveness of interventions to promote healthy eating in children aged 2-5 years attending centre-based childcare and intervention characteristics associated with promoting healthy eating (Chapter Four). This umbrella review examined more than 100 quality, primary studies and found that interventions were more convincing if interventions addressed both healthy eating and physical activity, targeted individual-level and environmental-level determinants and engaged parents. Notably, positive outcomes were more likely if the intervention was led by researchers or external experts, with results less likely to be positive if led by childcare providers unless externally supported. These findings warrant further exploration to understand what the barriers and facilitators are that affects the translation of evidence-based nutrition best practice into daily routines from childcare providers' perspective. By understanding these factors, insights into the evidence-to-practice gap could be addressed to better support healthy eating strategies. Few studies have explored practices from the stakeholders' perspective. In this chapter, three qualitative studies are undertaken with cooks, directors and influential decision-makers to understand what factors influence centre-based childcare providers' food and nutrition decisions and practices for children aged 2-5 years.

# **Study 1: Factors Influencing Food Service Provision Decisions in Centre-based Early Childhood Education and Care Services: Cooks' Perspective**

## **Preface**

This published paper aims to develop an understanding of what factors influence childcare cooks' food and nutrition decisions for children aged 2-5 years in centre-based childcare, including the barriers and facilitators. From the umbrella review two evidence gaps were apparent: that most of the primary studies were externally delivered and the results not replicated when delivered by childcare personnel and the need for engagement between childcare personnel and parents to enhance the success of obesity prevention interventions. Of interest to this thesis is the capacity of childcare providers to translate best practice nutrition into day-to-day routines. Confirmed by the umbrella review, formative and qualitative research is needed to understand the local context, particularly the barriers to best practice implementation and the identification of the drivers for the effective implementation of nutrition practices that support children. This is one of three studies interviewing key childcare personnel, with the first study focusing on cooks. The purpose of this published paper as part of the broader thesis is to understand what factors influence childcare cooks' food and nutrition decisions for children. Moreover, these findings will be used to inform the following studies with directors and influential decision-makers.

This paper has been peer-reviewed and accepted for publication with the citation:

Matwiejczyk, L., Mehta, K., & Coveney, J. (2019). Factors Influencing Food Service Provision Decisions in Centre-based Early Childhood Education and Care Services: Cooks' Perspective. *Journal of Health Promotion Australia*  
<https://doi.org/10.1002/hpia.308>

Reproduced with permission from John Wiley and Sons  
(License Number 4893350565533)

Author Contributions: LM developed the study design and undertook the data collection, analysis, interpretation, and reporting, as well as manuscript preparation. KM contributed to results interpretation and manuscript preparation. JC contributed to results interpretation and manuscript preparation.

## **Abstract**

Issue addressed: Considerable public effort has been directed at centre-based childcare as an early childhood education and care (ECEC) setting to promote healthy food-related behaviours in young children. However, in the real-world setting, best practice; evidence-based guidelines are not always well translated into usual, day-to-day routines. This study aims to understand what factors influence centre-based childcare cooks' food and nutrition decisions for children aged 2-5 years.

Methods: Semi-structured qualitative interviews were conducted with cooks in centre-based childcare using purposeful maximum variation sampling and data analysed thematically.

Results: Fourteen cooks were interviewed from 14 services across South Australia. Central to providing a healthy food environment was expert-led knowledge and training gained through the workplace over several years and the embodiment of the service's healthy food and nutrition policy, evidenced through menu-planning to maintain a focus on healthy eating. Threatening these positive, routine practices and decisions were pressures to modify menus in response to increasing food allergies and changing cultural and family preferences, in the absence of ongoing relevant training and expertise at the system-level.

Conclusions: Children in ECEC benefit from cooks' commitment to providing nutritious foods, however, the requirements to extend their role to respond to increasing demands without relevant system-level support and training puts the children at risk of not being exposed to health-promoting menus and possible errors in providing dietary modifications. ECEC cooks urgently need access to system-level support and training.

So What: Understanding and addressing the barriers experienced by cooks and the complexity of factors that inform their food-related decision-making will sustain the implementation of effective, healthy eating guidelines and nutrition practices in ECEC.

**Keywords: healthy diet, child care, menu planning, nutrition policy, Ecological Model Theory**

## 5.1 Introduction

Children's dietary patterns are usually attributed to the influence of the family<sup>1</sup>, but in high-income countries such as Australia, changes in mothers' workforce participation have given importance to the early childhood education and care (ECEC) setting.<sup>2</sup> In Australia, more than 720,000 pre-school aged children attend centre-based formal childcare with 79% of children attending on average, more than 20 hours per week.<sup>3</sup> As well as having a significant reach, dietary-related practices and interventions in ECEC settings are considered important because it is believed that this is the age when children's food preferences are being developed<sup>4</sup> and will track into adulthood.<sup>5,6</sup> For these reasons, public health effort is directed at ECEC settings to promote healthy lifestyle behaviours and to stem obesity levels.<sup>2,7,8</sup>

The research consensus is that healthy eating interventions and practices in ECEC have an impact on children's food preferences and consumption patterns.<sup>9-11</sup> However, in the real world setting where researcher or expert-led interventions have informed best practice, evidence-based guidelines are not well translated into usual, day-to-day routines.<sup>12</sup> Poor implementation and barriers to delivering interventions as part of daily routines have explained the lack of effectiveness.<sup>13</sup> Researchers have suggested that the dissonance between what is recommended and what is implemented be further investigated to understand the barriers and enablers contributing to this as well as understanding what factors influence childcare providers' decision-making.<sup>14-16</sup>

Childcare personnel are key influencers by making nutrition-related decisions and impacting children's dietary patterns.<sup>17,18</sup> Personnel usually comprise positions of directors (management and administration roles), educators (facilitators of childhood learning roles) and cooks (food preparation and service roles). Childcare personnel are influential because all food preferences and nutritional behaviours of children are learned<sup>4</sup> and childcare personnel determine food availability and children's access to food of varying quantities in the childcare food environment. They also provide guidance around food choices and role model food preferences.<sup>4</sup> A small number of studies have explored factors which influence educators' food-related decision-making in centre-based and home-based childcare.<sup>16,19-21</sup>

Decision-making is influenced by policy, and international guidelines recommend that children in childcare receive at least half to two-thirds of their daily energy and nutrient requirements.<sup>22</sup> Australia does not have legislated national benchmarks for nutrition intake, but childcare services must demonstrate that they meet the National Quality Standard that *Healthy eating and physical activity are promoted and appropriate for each child.*<sup>23</sup> To assist services, *Get Up & Grow: Healthy Eating and Physical Activity for Early Childhood (Get Up & Grow)*<sup>24</sup> government-funded resources promote key healthy eating messages and guidelines. Centre support to achieve this is variable between each State and Territory as each jurisdiction has responded with different strategies. Three states do not have state-level support including South Australia, although unique to this state was a multi-strategy, nutrition-incentive award scheme, *Start Right Eat Right (SRER)* that 88 % of services (n=313) participated in over 13 years before finishing in 2013 with positive results.<sup>25-28</sup>

The purpose of this study was to build on the research exploring the influence of ECEC personnel on the development of children's dietary behaviours and to understand the evidence-to-practice gap reported in the literature between what is recommended as best practice and what is enacted. Previous investigations have used quantitative studies, described in systematic reviews<sup>9</sup>, which have provided evidence of childcare personnel's impact but neglected to examine the context within which personnel influence children's nutrition. Previous studies have also focused on directors or educators who directly care for the children, but no studies have to the authors' knowledge explored the perception and experiences of cooks. Cooks have a key role in preparing and providing at least a daily lunchtime meal and a morning and afternoon mid-meal in the majority of South Australian childcare services. In Australia, cooks do not require training in nutrition but a food safety certificate or equivalent is an essential requirement specified in cooks' job and person specification. This study aims to develop an understanding of what factors influence childcare cooks' food and nutrition decisions for children aged 2-5 years in centre-based childcare, including barriers and facilitators. This understanding of local context, values and norms to cooks is important to strengthening the implementation of effective, healthy eating guidelines and nutrition practices which will improve children's nutrition-related health.

## 5.2 Method

### 5.2.1 Design

A semi-structured interview format was chosen to allow cooks to relate their experience as they perceived it and to use a process that was consistent but flexible, and allowed for further questions to become known to the researcher.<sup>29</sup> The interview guide was developed from an appraisal of comparable studies<sup>16, 19-21, 30-32</sup> and previous researcher observations of childcare services. The interview guide included open-ended questions about the childcare cooks' motivations, perceived facilitators and barriers to enacting their role, the meaning of healthy food and perceived responsibilities in their role as well what services needed to implement healthy nutrition (presented in Table 5-1). Motivations included questions about cooks' reasons and perceived processes that guided nutrition-related behaviour.

**Table 5-1:** Interview schedule for centre-based early education and care cooks exploring their perceptions of factors influencing food-decisions.

Aspect Addressed	Interview Questions
<b>Motivations for working as a cook</b>	Can you please tell me what made you become a cook?
<b>Meaning of healthy eating</b>	When you hear people talking about “healthy eating in children aged 2-5 years”, what does this mean to you?
<b>Factors that facilitate or constrain decisions</b>	What helps you to provide healthy eating in your centre? What hinders you to provide healthy eating in your centre?
<b>Perceived role and responsibilities</b>	When you hear mention of ‘government standards’ or ‘healthy eating guidelines’ what do you think of? What are your views about your role and responsibilities in providing healthy food? What about carers/parents’ role and responsibilities? What entitlements or rights do you think children have about the food they get in childcare if any?
<b>Recommendations for enablers to support healthy eating behaviours in children</b>	What do you think is needed to help childcare centres provide good food and healthy nutrition? Are there any other comments or anything you have said that you would like to add or change?



Interview questions were piloted with a centre-based childcare cook with 11 years of related experience and feedback contributed to minor modifications of the interview schedule. Relevant demographic questions were also developed with the cook. The primary author undertook the interviews to ensure consistency and was not known to the respondents before the study. Ethics approval for the study was received from Flinders University Social and Behavioural Research Committee (Project number: 7758) and the Department of Education and Children's Development.

### **5.2.2 Recruitment and sampling**

Cooks from centre-based ECEC services that provided cooked meals for children aged six weeks -five years of age in South Australia were recruited. Centre-based ECEC is provided in purpose-built buildings by professionally qualified personnel between 6 am and 6 pm, five days a week. Purposeful maximum variation sampling<sup>33</sup> was used across geographical areas and areas of differing social-economic status. Services for example were sampled from the southern and northern outer suburbs where areas are of lower socioeconomic status as indicated by Socio-Economic Indexes for Areas (SEIFA) measures.<sup>34</sup> In Australia, areas are ranked according to relative socio-economic disadvantage which is estimated using information from the five-yearly Census.<sup>34</sup> A service in an area of relative disadvantage does not mean that the families are also from this area as parents from more affluent areas could be using this service due to its proximity to work. Services were also sampled in areas with a relatively higher percentage of families from different cultures as well as rural areas. Potential differences between privately funded and not-for-profit services became apparent during early interviews. Services from the three main privately-funded enterprises were therefore added. Included in the sampling, were services which had only recently been established. Interviews continued until saturation where no new information was evident.<sup>35</sup> Saturation was determined in discussion with the co-authors and after scrutinising the responses following each interview.

At each service, after the director agreed that the cook could participate, a time and place convenient to the cook was arranged. Participation was voluntary, and cooks were given an information sheet and signed a consent form beforehand. Interviews took between 35-55 minutes and were audio-recorded.

### **5.2.3 Data analysis**

Data analysis by the primary author followed a six-step process described by Braun and Clarke (2006) for thematic analysis.<sup>36</sup> Interviews were transcribed from the audio files verbatim and an inductive process used to guide data analysis. Codes were inductively derived line by line using NVivo™ v.11 software. By looking for patterns in the coded data and at responses within and between the codes, emergent themes were identified.<sup>36,37</sup> Themes were further refined and explained as sub-themes emerged. Transcripts were revisited for additional supporting evidence or missed evidence.<sup>37</sup> Attention was also given to discordant views.<sup>37</sup> Each theme is described in the results section and supported with illustrative quotes.

The Ecological Model of Health Behaviour<sup>38</sup> (Ecological Model) was utilised to organise the theme structure. Ecological models provide frameworks for understanding the multiple and interacting determinants of health behaviours, such as nutrition-related practices. The multiple levels of behavioural influences include intrapersonal, interpersonal (social, cultural), physical (food environment), organisational, community and policy. Using the Ecological Model often involves adapting the model to a particular realm.<sup>38</sup>

To strengthen rigour, an audit trail including changes in decisions was kept throughout the process of coding and interpretations and findings were discussed with the co-authors until consensus was reached. Respondents' member checked a summary of the final results, and reporting followed Standards for Reporting Qualitative Research (SRQR) guidelines.<sup>39</sup>

## **5.3. Results**

### **5.3.1 Participants**

Cooks (n=14) from 14 services participated in interviews undertaken between October 2017 and April 2018, and characteristics are summarised in Table 5-2. All respondents were female, with a spread of ages between 35 - 57 years and were interviewed in the workplace, except for four interviews undertaken at the participants' home. Experience ranged between 18 months and 19 years with most cooks working in the same service they started at (n=11). Family-friendly school hours and familiarity with cooking were the main reasons

for cooks choosing to work in childcare services. For some it was opportunistic to become a cook, as stated by this cook who was offered a position when her children went through childcare 'I just fell into it' (Cook-9).

**Table 5-2:** Characteristics of 14 early education and care cooks and centre-based childcare services participating in semi-structured interviews exploring factors that influence nutrition and food-related decisions, South Australia

Characteristic	Data
<b>Provider</b>	
Female	14
Male	0
Experience, mean years (range)	10.2 (18months-19 years)
Not-for-profit	10.8 (3.5 years-17 years)
Private	9.8 (18 months-19 years)
Age, mean, years (range)	47 (32-58)
Not-for-profit	48 (38-56)
Private	42 (32-57)
Highest education level attained	
Secondary School	5
TAFE (Diploma, Certificate)	8
Tertiary (Degree)	1
<b>Site</b>	
Centre type (n)	
Not-for-profit	8
Private	6
Number of places for children, mean (range)	73 (40-137)
Not-for-profit	74 (40-137)
Private	71 (50-90)
Foods service provided (n)	
Cooked on site, lunch and mid-meals	13
Cooked on site, breakfast, lunch and mid-meals	1

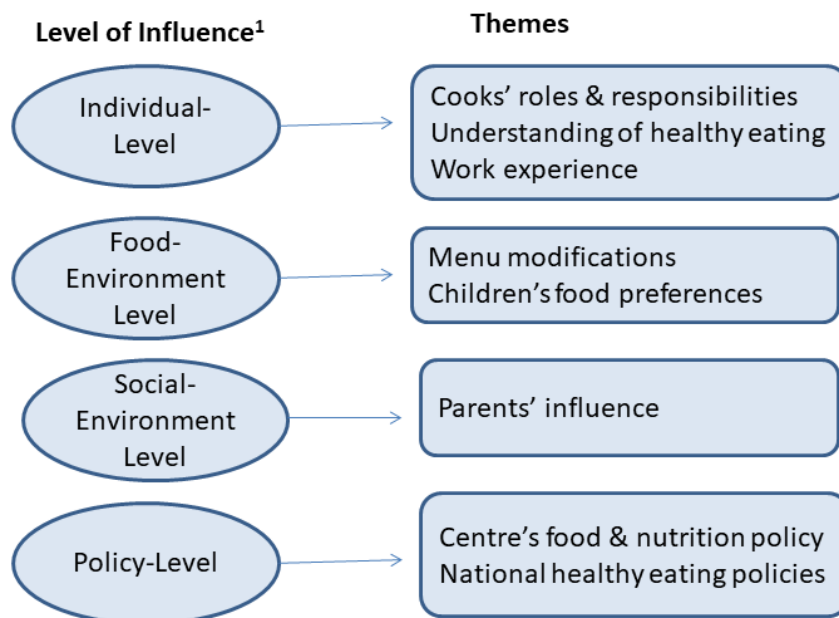
### 5.3.2 Main Influencers on cooks' decision-making

Eight main themes emerged from the analysis (Figure 5-1). Based on the Ecological Model<sup>38</sup>, these were grouped into four levels of influence with each level describing interactions at levels with decreasing influence by the cook: individual-level (cooks' characteristics including roles and responsibilities, understanding of healthy eating, workplace experience); food-environment (menu modifications, allergies); social environment (children's food preferences, and parents' influence); policy-level (service food policy, national healthy eating policies).

**Individual –level of influence (cooks’ roles and responsibilities, understanding of healthy eating, workplace experience)**

Cooks were universally concerned with children’s dietary and development needs, and cooks were unanimous that their role and responsibility was to provide food and that food was to be healthy, with variety and choices. Many participants expressed similar views as stated by this cook,

I feel it’s my job to provide the healthy food. I do. It’s my job to provide the healthy food and to shop and make sure the kids have a good – a choice as well and have a variety (Cook-9).



<sup>1</sup>Levels of influence, Ecological Model of Health Behaviours (Sallis Owen & Fisher, 2008)

**Figure 5-1:** Themes from thematic analysis of semi-structured interviews of 14 early care and education cooks exploring factors which influence childcare decision-making relating to food and nutrition, South Australia.

Choices within the context of providing healthy foods were mentioned by all of the cooks "I mean I provide the food, and they choose – especially the older kids, they choose what they would like to eat and how much they'd like to eat" (Cook-4). Providing a variety of foods included different textures, flavours and foods that children may not be exposed to at home. All of the cooks took this responsibility seriously, "We have the duty of care while

they're in here" (Cook-3). This was reiterated by other cooks "So I think as long as they're in our care in that day, they are our responsibility" (Cook-4).

Cooks also shared a common understanding of healthy eating and often described this as meals that were: 'colourful', had 'food variety' and were 'appealing to the children', met children's 'food group needs' and/or 'provided 50% the Recommended Daily Intake' for children's key nutrient requirement, were low in fat, added sugar and salt and 'cooked daily from fresh ingredients'. For example, healthy eating was described as,

Healthy eating? It means obviously like having their fruit and vegetables but having their five food groups. It also means not having a lot of fats, sugars, salt, all that type of ingredients in food. So, providing them a meal without a lot of sugar or a lot of fat in it, using spices and that, to give it flavour rather than salt and pepper and – yeah – and variety, (Cook-3).

When describing food practices, the information cooks reported was nearly always consistent with evidence-based guidelines recommended for young children. Many of the cooks attributed long-term experience working in the services as enabling them to adjust the quantities of food or plan a health-promoting menu intuitively or as 'second nature'. As one cook explained,

It's easy. It really is. It's not hard at all, not after you've done it for so long. It's not – yeah, it's not hard, and I'm just very intuitive now (Cook-9).

Most of the cooks attributed their menu-planning and nutrition knowledge to training, information and tools from a multi-strategy nutrition program directed at directors and cooks which was implemented at the workplace for 13 years, finishing in 2013. A cook with considerable experience commented,

..we don't have any funding from Start Right Eat Right now, but we follow Start Right Eat Right things in our menu with our budget and staff, we are trying our best to follow that stuff (Cook-1).

Two cooks employed post-SRER cited personal knowledge as a fitness instructor or as a qualified chef to guide their decisions although they also used menu-planning resources and

tools left by the services' previous cooks. Most of the cooks from private services spoke of receiving training from Nutrition Australia, a national, independent, not-for-profit member-based organisation that promotes healthy nutrition. Cooks used SRER and Nutrition Australia charts of quantities of food ingredients for particular numbers of children most commonly and menu-planning guidelines to meet at least 50% of a child's Recommended Daily Intake (RDI) for key nutrients in a fortnightly menu (Victoria Government n.d). The guidelines were often recited spontaneously,

So we have guidelines of how many red meat meals we have to provide, how many white or fish meals, how many vegetarian, and etcetera, etcetera. So, I then work it out over a fortnight. So, usually, most weeks, I'll do two red meat, one chicken, one tuna, 'cause that's what we use as our fish – one tuna and then one vegetarian (Cook-3).

All cooks reported searching online for recipes either at work or mostly at home and a few cooks visited popular social media platforms for food ideas. None of the cooks used online programs for menu-planning and only one cook used government-sponsored websites for ECEC menu-planning information. Reasons for cooks' reluctance to use on-line programs was that they perceived themselves as computer-illiterate, "Cause I'm not very good on a computer. I <laughs> would – yeah, I prefer – I guess I'm a bit old-fashioned that way. I would prefer to talk to someone and ask questions than put questions in a computer and try and find the information" (Cook-3). Most of the cooks said they did not have a need for computer programs and did not have easy access to computers at home. All of the cooks had limited computer access at work, needing to share a computer with other staff, and this was perceived as inconvenient by most cooks, "I could use the computer here, but I'd have to leave the kitchen and whatnot, so I don't" (Cook-12). All of the cooks expressed a preference for face-to-face training with other cooks because of the opportunities for peer-support, as shared by this cook reflecting on a recent training experience "I think we almost got as much information from talking to each other" (Cook-3).

### ***Food-environment (menu modifications including allergies)***

Cooks described an efficient workflow, meeting mealtime deadlines and an adequate food budget. None of the cooks identified the food budget as being a barrier but spoke of it as a key consideration and of strategies developed over the years to manage it, “I’m a very savvy shopper” (cook-9). Cooks also acknowledged support from management for a reasonable food budget such as this cook commenting on the end of year review of the budget, “you spent a bit more, but they do understand that food goes up” (Cook-9). The most significant challenge to cooks relating to budget was however having adequate paid time to complete all of their tasks. This statement summarised the situation for most cooks,

I'm pretty good with my hours. I can go a little bit over or a little bit under. Other cooks have got four hours to do everything and that's it. They don't have time to go roasting chickens or roasting lamb or doing things that are absolutely crazy. They just can't fit it in 'cause we don't just cook. We do dishes and clean as well (Cook-4).

Cooks spoke of managing potential barriers such as services being purpose built with adequate storage and space for cooking although the equipment is often for domestic use and not commercial. Despite this and having a limited budget and limited time for food preparation most cooks believed they had the skills and support to deliver a quality menu.

Of concern to most of the cooks were food allergies and food intolerances, which were increasing in number and complexity. Most cooks also spoke of additional dietary restrictions due to cultural preferences and changing family food preferences and beliefs. Several cooks recited a long list of modified diets,

I have – on the top of my head, I have three vegans, a vegetarian, and these are under-three-year-olds – three and under. Yeah. Three vegans, a vegetarian – I have three egg allergies. I have – and they're mostly full time – sorry, I have four egg allergies. One of the egg allergies also has a gluten allergy and nuts. So, he's my hardest one. Then I also have those that can't have strawberries, pineapple, or kiwi. One that can't have banana, apple, potato, bread or rice – yep, I'm just trying to think – others like dairy or lactose-free. One can't have onion or garlic. Sorry, two can't have onion or garlic because they've got intolerance to it (Cook-1).

Cooks acknowledged the responsibility and risk associated with this, “Well, some of them got serious allergies too – so there’s no, ‘beg your pardon’, if you do get it wrong” (Cook-12). Many cooks described this as the principal challenge and worry associated with their jobs, “It scares me, the allergies, the potential risk for that cross-contamination and it’s a worry” (Cook-8). Keeping children safe, the extra time associated with dietary modifications and concerns about menus lacking variety were the biggest challenges for cooks when describing factors that constrained the provision of food. Some cooks also felt conflicted with restricting the menu for all of the children and the menu not being able to meet daily food-group requirements.

### ***Social-environment (children’s food preferences, and parents’ influence)***

At the social-environment level, the most influential factor for all cooks was children's food preferences. Menus were planned on what the children enjoyed within the context of healthy food. All of the cooks spoke of ‘trial and error’, “You just try it out and try it a few times and if they don’t like it, I don’t do it again” (Cook-6). Most of the cooks sought feedback indirectly by registering what food the children left, “I guess my feedback is if the food comes back with empty trays” (Cook-4). Several visited the rooms for feedback from educators and the children. Many cooks expressed concern with establishing healthy eating habits, introducing variety in the menu and catering to the child’s palate.

All of the cooks acknowledged parental responsibility for foods provided outside of the service, “I think once they leave the centre, you really don’t have any say or any right to tell the parents what to feed their children” (Cook-7). For most cooks interactions with parents were limited to sharing recipes and clarifying complex dietary requests. Despite this differentiation in responsibility between foods provided within the service (cooks’ remit) and foods provided outside of the service (parents’ realm), many held views about what parents' should do. Most cooks were concerned whether practices in the service continued at home, particularly introducing variety, different flavours and textures, persisting with repeated food exposures and providing healthy food. Cooks juggled the complex requirements of children’s food preferences, children’s developmental needs and parental family food preferences. Paradoxically, cooks asserted service food provision as their remit,



but acquiescence to parents' requests for dietary modifications. Cooks rationalised, "You just have to follow what the parents want. You have to respect their choices" (Cook-10).

### ***Policy-level of influence (service food policy, national healthy eating policies)***

Implicit in cooks' responses was that local service-policy drove what they did, "I guess the policy is just a guideline because we so believe in what it is that we do" (Cook-5). All services had a local food and nutrition policy or a standardised policy for services belonging to the same group of private services. The policies referred to children being provided with healthy food that was consistent with the Australian National Dietary Guidelines<sup>40</sup> and met 50% of their RDI for key nutrients with no child going hungry. All of the cooks spoke to these principles when describing what to feed the children, and one cook commented on the service policy, "It's just a given now" (Cook-8). For many cooks, the service's healthy eating guidelines were embodied in what they did. Making food decisions based on the service's food policy was easy for cooks, "I think it's really easy. I think it's black and white, to be honest" (Cook-1) although one of the two cooks relatively new to working in the sector, recommended "we need more policies for us to go to, a go-to place so that we can go, 'All right, well, it's black and white' rather than grey" (Cook-11). A few cooks acknowledged that food and nutrition policies specific to each age group and advice on catering to food allergies and food intolerances were needed.

Although services have access to online government information, none of the cooks mentioned external policies such as the National Quality Framework's nutrition-related standards<sup>23</sup> or the United Nations Charter of Children's Rights which states children are entitled to healthy nutrition (Article 24).<sup>41</sup> Other Australian government guidelines and resources not immediately recalled included the *Australian Guide to Healthy Eating* for 2-5 year-olds.<sup>40</sup> and *Get Up & Grow: Healthy eating and physical activity in early childhood*.<sup>24</sup>

## **5.4. Discussion**

This study aimed to understand what factors influence childcare cooks' food and nutrition decisions to provide insights into the implementation of evidence-based guidelines and

practices into day-to-day routines. Using the Ecological Model by Sallis and colleagues (2008)<sup>38</sup> the following was noted in the findings. At the first level of influence, enabling factors included cooks' perceived role and commitment to providing healthy food within the service to shape children's health behaviours, and their universal understanding of healthy eating and knowledge accrued after years of work experience in the same service, augmented with some training and resources from experts. At the food-environment and social-environment levels, children's food preferences were the most influential factor and cooks' efficacy to provide food was bolstered by the translation of centre-based healthy eating policies shaped at the organisational and sector level, into day-to-day menu-planning and practices. According to cooks, pressures threatening their efficacy were increasing numbers of food allergies and food intolerances and changing cultural and family food preferences.

From these findings, many cooks were drawing upon residual knowledge gained from training in the past to inform their day-to-day practices. Cook attrition, increasing demands for menu modifications and the absence of systems-level workplace training and education are threats to the sustainability of their positive food practices and also pose risks for the provision of nutritionally adequate and safe foods to children.

#### **5.4.1 Risks to the cooks sustaining positive food practices**

The enablers to provision of healthy meals for children identified by this study, are in contrast to other qualitative studies which found childcare providers' decisions to be less evidence-based, and to rely instead on personal beliefs, personal knowledge, information on the internet, experiences of eating as a child and convenient food decisions to keep mealtimes running smoothly.<sup>16, 19, 21, , 30,31</sup> Childcare providers in other studies, predicated their food-decisions on 'common sense' reflecting their personal beliefs which were not necessarily evidence-based.<sup>19, 21, 30</sup> Unique to this study was cooks' common understanding of healthy eating which may be attributed to the high participation by child care services in the SRER program (88%, n=313)<sup>25-28</sup> as well as, long-term employment of most cooks, resulting in residual knowledge from the program. Through their description of menu planning and decision-making, cooks demonstrated a correct understanding of nutrition, in accordance with the Australian Dietary Guidelines.<sup>40</sup> They also expressed a degree of

confidence in their nutrition knowledge. Their nutrition knowledge was mostly attributed to training in the past and the use of nutrition programs as frameworks for decision-making. Comments from cooks employed post-2013 when state-wide training ceased suggest that evidence-based nutrition knowledge may no longer be consistent across the cook population. Objective assessment of nutrition knowledge has not been undertaken for cooks and for ECEC educators has been found to be equivocal.<sup>42</sup> Researchers agree that there is a reliance on personal nutrition knowledge<sup>19, 21, 30</sup> and that the main reason for a lack of healthy eating policy compliance is poor nutrition knowledge of ECEC co-workers.<sup>14,46</sup> To address this barrier, affordable, accessible and regularly available system-wide training for cooks is recommended as proposed for ECEC educators by other researchers.<sup>14,19,42,46</sup> Also of note, was that cooks in this study believed that their role was important in shaping children's long-term healthy eating behaviours whereas, in a US study, childcare and family childcare providers identified their role as preparing children for school readiness and being good citizens.<sup>32</sup>

Common to other studies was that children's food preferences were a strong driver for cooks' food-decisions.<sup>16, 20, 21, 30.</sup> Cooks described how foods were selected on what children liked and how new foods were eliminated if children refused to eat them. A significant challenge described by cooks was the increasing number of food allergies, food intolerances, family food preferences and menu restrictions needed to meet changing food preferences. Similar trends in child care of increasing menu complexity and an increasing number of food allergies have been reported in the US and elsewhere in Australia.<sup>19, 21</sup> Researchers suggest that parental requests for special foods on the basis of undiagnosed allergies compel childcare services to adapt the menu to suit the food preferences of families.<sup>19, 21</sup> Another driver for the trend of special diets is the increasingly diverse cultural composition of the Australian population<sup>44</sup> and the observation that one in three Australian adults eat gluten-free, meat-free or dairy free.<sup>45</sup> The transfer of this trend, via parental requests to childcare services, could explain the rise in demand, challenging cooks who are drawing upon limited formal knowledge to adapt old menus that do not reflect modern food trends.

A lack of childcare provider knowledge of evidence-based guidelines or practices inconsistent with those recommended has been reported in other studies.<sup>19, 30</sup> In this and

other studies<sup>19, 30,31</sup>, few cooks were aware of government-produced information or regulations developed to assist early childhood with best practice. Previous research has established that national nutrition guidelines were of little-perceived value<sup>30</sup> or were interpreted inconsistently.<sup>21</sup> Sourcing government-produced information<sup>24</sup> in this study was further inhibited by cooks' disinterest to use online sites and computer programs, compounded by a lack of access and computer literacy training.

Cooks in this study described many positive practices that demonstrated their perceived role to shape children's nutrition-related health behaviours. Drawing upon knowledge from past government nutritional investment in resources coupled with the challenge of modifying menus to meet increasing food allergies and intolerances and changing cultural and family food preferences suggest that these positive practices might not be sustainable. Compounding this, natural staff attrition will mean that new cooks may draw upon non-evidence based personal experiences and beliefs to manage their role, as was found.<sup>21,31</sup> In one interstate and several overseas studies this is associated with the provision of food which is not consistent with recommended national dietary guidelines.<sup>16, 19-21, 30, 32, 44, 47</sup> The cooks in this study, therefore, are in a vulnerable situation whereby their current food provision knowledge drawing on old training may be adequate however, they need ongoing training and development in order to provide healthy food for children, into the future.

A fundamental premise of the Ecological Model is that behaviour change is maximised when the environment and policies support best practice, and when individuals are educated and supported to enact best practice.<sup>38</sup> Lack of training opportunities, time limitations, low levels of computer literacy and a preference for face-to-face training were identified by cooks as barriers to professional development. High participation rates in SRER were attributed to six hours of face-to-face training of cooks and directors, menu-planning tools and access to support from a nutrition professional. As an incentive, services that met the SRER criteria for menu-planning and a positive, mealtime-environment received an award which acknowledged their efforts to provide and promote healthy food.<sup>25-28</sup> This was enabled by project management funding from the state health department. To meet the professional development needs of cooks, future training would ideally be face-to-face with local cooks from several services, regularly available and backfilled for sole cooks to attend. An investment in strengthening cooks' computer literacy would enable cooks to use

complementing online resources and social media for peer support. Resourcing this would require the ECEC sector's commitment for a systemic approach and policy support.

#### **5.4.2 Children at risk of not being supported or provided with healthy food**

Childcare impacts positively on children's dietary food patterns<sup>9, 11, 12, 48, 42</sup> and cooks undeniably have an important role in providing healthy food that appeals to children and facilitates healthy eating habits. The National Health and Medical Research Centre funded Centre for Food and Allergy Research, and the Australasian Society of Clinical Immunology and Allergy released consensus guidelines advising the timely exposure of egg, peanut and other common allergy-causing foods in the first year of life to prevent food allergy.<sup>49</sup> These guidelines contradict current practice in some child care services where common allergens, particularly nuts, are universally avoided for all children due to the risk of allergen exposure for the few children with known food allergy. There is the risk that children without allergies will not be exposed to foods in a timely way at a sensitive period. Besides, cooks and educators are not always explicitly trained in how to adjust meals or menus for food allergies, thereby increasing the risk of an adverse event for children with food allergies.

Some child care services in Australia have responded by encouraging parents to provide their own food<sup>49</sup> however, accepting lunchboxes and food from home is also problematic. Food bought from home tends to be more nutrient poor and energy dense.<sup>50</sup> In Australia, 30% of children's total energy intake (aged 3-5 years) is from nutrient-poor, and energy dense foods<sup>50</sup> which have been attributed to causing dental caries and excessive weight gain.<sup>17, 32</sup> If ECEC services provide the food, and personnel are appropriately trained, the risk of an adverse allergen-response is minimised and children are exposed to a wide variety of health-promoting foods. In this study, changing food preferences and the need for menu modifications without training and support were significant barriers to ensuring all children received exposure to health-promoting foods during a crucial developmental time.

#### **5.4.3 Consistency between home and childcare**

Crucial to children developing healthy eating behaviours is the consistency of foods choices and behaviours between the service and the home.<sup>51</sup> Parents disinterested in what foods are served<sup>21</sup> and parents undoing the positive influence of the services' influence on

children's eating behaviours<sup>16, 19, 30</sup> have been previously identified as barriers to achieving healthy eating for children. Congruent with previous research<sup>16, 19, 21, 30, 32</sup>, cooks in this study perceived that centre-provided food was consistently healthier than food provided at home. Children who attend childcare have been found to consume more fruit, vegetables and low-fat dairy foods compared to children who do not attend childcare, as well as, less energy from high-sugar, high-fat foods and sugary drinks.<sup>47</sup> A systematic review found that parents consider the responsibility for providing healthy food and promoting healthy eating habits as being collective, and expected childcare personnel to assist them to provide healthy food at home.<sup>15</sup> At a minimum, parents expected ECEC services to provide information to help the family with healthy eating<sup>15</sup>, but parent engagement in childcare has been found to be somewhat limited.<sup>48</sup> A premise of the Ecological Model is that specific health behaviours can be changed with multi-level strategies.<sup>38</sup> Cooks, therefore, could have a role beyond mere food provision within the service and are well placed to engage with and support parents, in order to foster positive food-related health behaviours for children.

Strengths of this qualitative study were that respondents shared their experience and perceptions, providing the context within which evidence-based guidelines and practices occur. Perceived enablers, barriers and motivations provided insights into the feasibility of evidence-based guidelines and practices being enacted. Rigour was ensured with data analysed by the same researcher in discussion with the co-authors until consensus was achieved. As well as peer debriefing and external auditing by the co-authors, findings were member checked and reporting followed validated guidelines.<sup>38</sup> A possible limitation of this study was that of social desirability and the subjectivities of the researchers' interpretations as part of qualitative research.<sup>29</sup> Another limitation of this study was that the cooks' experience might be unique to South Australia and the narrow remit of cooks, primarily directed at food provision. Cooks are only one of the other possible influencers, and food provision is but one of the many factors influencing children's developing nutrition-related behaviours in ECEC settings. To fully understand what is contributing to the implementation gap, qualitative research needs to be undertaken with other key providers such as directors and educators.

## 5.5. Conclusion

Unique to this study has been the identification and exploration of factors which influence cooks' food-decisions in centre-based childcare. Using the Ecological Model of Health Behaviour,<sup>38</sup> this study found that cooks consider a complex number of influencers, including the diverse preferences of many children and parental preferences. This is considered within the context of cooks' own beliefs and their motivation to meet children's developmental needs. Central to cooks providing a healthy food environment in ECEC settings has been nutrition-related professional development mostly provided in the past, and healthy food and nutrition policies in services. Cooks were found to apply these principles to their menu-planning to achieve a focus on healthy eating. Threatening these positive practices were pressures to modify menus in response to food issues such as increasing food allergies and cultural and family preferences, in the absence of available training and expertise at the system-level. These pressures to extend the scope of practice of cooks to more complicated dietary provisions put both cooks and children at risk. National standards<sup>23</sup> and the United Nations Convention on the Rights of the Child (Article 24)<sup>41</sup> state that children are entitled to food that promotes healthy food-related behaviours and protects them from non-communicable diseases. Cooks have an important role in supporting healthy food-related behaviours and translation of best practice nutrition guidelines into usual routine practices, requires that they are supported with sustainable, ongoing systemic workplace training, education and support. Other than a food safety certificate, cooks are not required to have nutrition training and there is an urgent need to correct this. According to cooks, regular face-to-face training complemented with online resources and support from experts is their training preference. Policy support for a systemic approach which creates a supportive learning environment and resources cooks to participate in regular training is recommended. Further research is needed into the changing food preferences of families to inform nutrition interventions and strengthen the feasibility of the implementation of recommendations into the real-world context.

## References

1. Peters J, Parletta N, Campbell K, Lynch J. Parental influences on the diets of 2- to 5-year-old children: Systematic review of qualitative research. *Journal of Early Childhood Research*. 2014;12(1):3-19.
2. Larson N, Ward DS, Neelon SB, Story M. What role can child-care settings play in obesity prevention? A review of the evidence and call for research efforts. *Journal of the American Dietetic Association*. 2011;111(9):1343-62.
3. Department of Education & Training. Early Childhood and Child Care in Summary. September quarter 2017. Canberra, Australia: 2018. Available from: [https://docs.education.gov.au/system/files/doc/other/eccc\\_in\\_summary\\_sep\\_quarter\\_2017.pdf](https://docs.education.gov.au/system/files/doc/other/eccc_in_summary_sep_quarter_2017.pdf) [Verified 6th December 2018].
4. Birch LL, Doub AE. Learning to eat: birth to age 2 y. *American Journal of Clinical Nutrition*. 2014;99(3):723S-8S.
5. Mikkila V, Rasanen L, Raitakari OT, Pietinen P, Viikari J. Consistent dietary patterns identified from childhood to adulthood: the cardiovascular risk in Young Finns Study. *British Journal of Nutrition*. 2005;93(6):923-31.
6. Nicklaus S, Boggio V, Chabanet C, Issanchou S. A prospective study of food variety seeking in childhood, adolescence and early adult life. *Appetite*. 2005;44(3):289-97.
7. World Health Organisation. Interventions on diet and physical activity: what works. Geneva: World Health Organization, 2009. Available from: <http://www.who.int/dietphysicalactivity/summary-report-09.pdf> [Verified 6th December 2018].
8. World Health Organization. Report of the commission on ending childhood obesity. Geneva: World Health Organization, 2016. Available from: <https://www.who.int/end-childhood-obesity/publications/echo-report/en/> [Verified 6th December 2018].
9. Bell LK, Golley RK. Interventions for improving young children's dietary intake through early childhood settings: a systematic review. *International Journal of Child Health and Nutrition*. 2015;4(1):14-32.
10. Mikkelsen MV, Husby S, Skov LR, Perez-Cueto FJ. A systematic review of types of healthy eating interventions in preschools. *Nutrition Journal*. 2014;13:56.
11. Sisson SB, Krampe M, Anundson K, Castle S. Obesity prevention and obesogenic behavior interventions in child care: A systematic review. *Preventive Medicine*. 2016;87:57-69.
12. Matwiejczyk L, Mehta K, Scott J, Tonkin E, Coveney J. Characteristics of Effective Interventions Promoting Healthy Eating for Pre-Schoolers in Childcare Settings: An Umbrella Review. *Nutrients*. 2018;10(3):293.
13. Jones J, Yoong SL, Wyse R, Ward DS, Wolfenden L. Improving the impact of obesity prevention interventions in the childcare setting: The need for a systematic application of implementation science. *Journal of Paediatrics and Child Health*. 2017;53(3):211-3.
14. Lanigan JD. The relationship between practices and child care providers' beliefs related to child feeding and obesity prevention. *Journal of Nutrition Education and Behavior*. 2012;44(6):521-9.
15. Mazarello Paes V, Ong KK, Lakshman R. Factors influencing obesogenic dietary intake in young children (0–6 years): a systematic review of qualitative evidence. *BMJ Open*. 2015;5(9).
16. Lyn R, Evers S, Davis J, Maalouf J, Griffin M. Barriers and Supports to Implementing a Nutrition and Physical Activity Intervention in Child Care: Directors' Perspectives. *Journal of Nutrition Education and Behavior*. 2014;46(3):171-80.
17. Swyden K, Sisson SB, Lora K, Castle S, Copeland KA. Association of childcare arrangement with overweight and obesity in preschool-aged children: a narrative review of the literature. *Int J Obes*. 2017;41(1):1-12.
18. Ward S, Bélanger M, Donovan D, Carrier N. Childcare Educators' Influence on Physical Activity and Eating Behaviours of Preschool Children: A Systematic Review. *Canadian Journal of Diabetes*. 2015;39 (Supplement 1): S73.



19. Cole A, Vidgen H, Cleland P. Food provision in early childhood education and care services: Exploring how staff determine nutritional adequacy. *Nutrition & Dietetics*. 2017;74(1):105-10.
20. Lynch M, Batal M. Child Care Providers' Strategies for Supporting Healthy Eating: A Qualitative Approach. *Journal of Research in Childhood Education*. 2012;26(1):107-21.
21. Otten JJ, Hirsch T, Lim C. Factors Influencing the Food Purchases of Early Care and Education Providers. *Journal of the Academy of Nutrition and Dietetics*. 2017;117(5):725-34.
22. Benjamin Neelon SE, Briley ME. Position of the American Dietetic Association: benchmarks for nutrition in childcare. *Journal of the American Dietetic Association*. 2011;111(4):607-15.
23. Australian Children's Education Care Quality Authority. Guide to the National Quality Framework. Sydney Australia 2018. p. i-688. Available from: <http://files.acecqa.gov.au/files/NQF/Guide-to-the-NQF.pdf> [Verified 6th December 2018].
24. Bell LK, Hendrie GA, Hartley J, Golley RK. Impact of a nutrition award scheme on the food and nutrient intakes of 2- to 4-year-olds attending long day care. *Public Health Nutrition*. 2015:1-9.
25. Golley RK, Bell L, Matwiejczyk L, Hartley J. South Australian Long Day Care Centres engaged with a nutrition incentive award scheme show consistency with mealtime practice guidelines. *Nutrition & Dietetics*. 2012;69(2):130-6.
26. Matwiejczyk L, McWhinnie JA, Colmer K. An evaluation of a nutrition intervention at childcare centres in South Australia. *Health Promotion Journal of Australia*. 2007;18(2):159-62.
27. Tysoe J, Wilson C. Influences of the family and childcare food environments on preschoolers' healthy eating. *Australasian Journal of Early Childhood*; 2010;35(3):105-14.
28. Creswell J & Poth C. *Qualitative Inquiry and Research Design : Choosing Among Five Approaches*. USA: SAGE Publications; 2017. 488 p.
29. Lynch M, Batal M. Factors Influencing Childcare Providers' Food and Mealtime Decisions: An Ecological Approach. *Child Care in Practice*. 2011;17(2):185-203.
30. Ray C, Määttä S, Lehto R, Roos G, Roos E. Influencing factors of children's fruit, vegetable and sugar-enriched food intake in a Finnish preschool setting – Preschool personnel's perceptions. *Appetite*. 2016;103:72-9.
31. Sisson SB, Kiger AC, Anundson KC, Rasbold AH, Krampe M, Campbell J, et al. Differences in preschool-age children's dietary intake between meals consumed at childcare and at home. *Preventive Medicine Reports*. 2017;6:33-7.
32. Suri H. Purposeful Sampling in Qualitative Research Synthesis. *Qualitative Research Journal*. 2011;11(2):63-75.
33. Australian Bureau Statistics. 2033.0.55.001 Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA) Australia, 2016, . Canberra: 2018. Available from: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2033.0.55.001> [Verified 6th December 2018].
34. Namey E, Guest G, McKenna K, Chen M. Evaluating Bang for the Buck: A Cost-Effectiveness Comparison Between Individual Interviews and Focus Groups Based on Thematic Saturation Levels. *American Journal of Evaluation*. 2016;37(3):425-40.
35. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3(2):77-101.
36. Fereday J, Muirane E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods*. 2006;5(1):80-92.
37. Sallis J Owen N Fisher E. Ecological Models of Health Behaviour. Chapt 20 in *Health behavior and health education: theory, research, and practice*. Editors: Glanz, Karen, Rimer, Barbara K., Viswanath, K. 4th edition.2008. p. 465-85
38. O'Brien CB, Harris BI, Beckman JT, Reed AD, Cook AD. Standards for Reporting Qualitative Research: A Synthesis of Recommendations. *Academic Medicine*. 2014;89(9):1245-51.
39. Department Health & Ageing. *Get Up & Grow: Healthy Eating and Physical Activity for Early Childhood*. Staff and Carer Book. Australian Government. 2009: p. i-90 Available from:

<http://www.health.gov.au/internet/main/publishing.nsf/Content/phd-gug-staffcarers> [Verified 6th December 2018].

40. National Health and Medical Research Council (2013) Australian Dietary Guidelines Educator Guide Canberra: National Health and Medical Research Council. Available from: [https://www.eatforhealth.gov.au/sites/default/files/content/The%20Guidelines/n55b\\_educator\\_guide\\_140321\\_1.pdf](https://www.eatforhealth.gov.au/sites/default/files/content/The%20Guidelines/n55b_educator_guide_140321_1.pdf) [Verified 6th December 2018].

41. Australian Bureau of Statistics. 2071.0 - Census of Population and Housing: Reflecting Australia - Stories from the Census 2016, 2017. Available from: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/2071.0> [Verified 6th December 2018].

42. Hendrie G, Baird D, Golley S., Noakes M. CSIRO Healthy Diet Score 2016. Available from: <https://www.totalwellbeingdiet.com/media/1194/2016-csiro-healthy-diet-score.pdf> [Verified 6th December 2018].

43. Gubbels JS, Gerards SM, Kremers SP. Use of food practices by childcare staff and the association with dietary intake of children at childcare. *Nutrients*. 2015;7(4):2161-75.

44. Robson SM, Khoury JC, Kalkwarf HJ, Copeland K. Dietary Intake of Children Attending Full-time Child Care: What are they eating away from the Child-Care Center? *Journal of the Academy of Nutrition and Dietetics*. 2015;115(9):1472-8.

45. Ling J, Robbins LB, Wen F. Interventions to prevent and manage overweight or obesity in preschool children: A systematic review. *International journal of nursing studies*. 2016;53:270-89.

46. Wolfenden L, Jones J, Williams CM, Finch M, Wyse RJ, Kingsland M, et al. Strategies to improve the implementation of healthy eating, physical activity and obesity prevention policies, practices or programmes within childcare services. *The Cochrane Database of Systematic Reviews*. 2016;10: CD011779.

47. Australasian Society of Clinical Immunology and Allergies. ASCIA Guidelines- Infant Feeding and Allergy Prevention. 2016. Available from: <https://www.allergy.org.au/patients/allergy-prevention/ascia-guidelines-for-infant-feeding-and-allergy-prevention> [Verified 6th December 2018].

48. Australian Bureau of Statistics. 4364.0.55.0001 National Health Survey First Results 2014-2015 Commonwealth Government of Australia; 2015. <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4364.0.55.001> [Verified 6th December 2018].

49. Morris H, Skouteris H, Edwards S, Rutherford L. Obesity prevention interventions in early childhood education and care settings with parental involvement: a systematic review. *Early Child Development and Care*. 2014;185(8):1283-313.

50. United Nations Committee of the Rights of the Child (CRC) General comments No. 15 (2013) on the rights of the child to the enjoyment to the highest attainment of the standard of health (art. 24) 2013. Available from: <https://www.refworld.org/docid/51ef9e134.html> [Verified 6th December 2018].

## **Study 2: Factors Influencing Nutrition-related Decisions in Centre-based Childcare: Directors' Perspective**

### **Preface**

This study aims to develop an understanding of the experiences and perceptions of childcare directors relating to nutrition and the factors that influence directors' nutrition-related decisions. Prompting this qualitative research are the findings from the umbrella review, which showed that positive nutrition-related outcomes were mostly facilitated by external experts and the results were not replicated by childcare providers without external support. Research in the previous study with cooks identified a number of factors which facilitate and constrain the capacity of cooks to translate evidence-based nutrition practices into day-to-day routines. The findings demonstrated that guidance and support from directors was central to cooks enacting their duties; and cooks interact with directors on a daily basis. Directors are responsible for the daily management of the services and the delivery of quality services to children and families. As such they are influential and their views warrant investigation as part of this thesis. This is the second of three studies interviewing key childcare personnel. The purpose of this study, as part of the broader thesis, is to understand what factors influence directors' nutrition-related decisions and practices. As with the study with cooks, these findings will be used to inform the following study with influential decision-makers.

### **5.1. Introduction**

The previous study found that cooks' decisions were shaped by the food preferences of children with diverse developmental needs, as well as the expectations from parents, educators and directors. Furthermore, changing food trends within families and society impacted cooks' decisions. These decisions were further shaped by cooks through considering what could be achieved within their capacity and available resources. It was found that cooks provided many positive nutrition-related practices, and their work was imbued with a commitment to support children to develop lifelong healthy food-habits.

However, the operationalisation of this role was fragile, with cooks relying on past work experience and training to make best practice food decisions. Unsupported by systemic professional development, and in the face of increasing allergies and changing family food preferences, cooks were unanimously concerned about the sustainability of maintaining a health-promoting menu. The previous study also highlighted the remit of cooks as food providers and the complex interplay of factors which influence their decision-making. As such, centre cooks influence one aspect of children's nutrition. Examining other influences, including influencers who have responsibility for a broader decision-making role, may provide a fuller understanding.

Centre directors have this responsibility as they are required to oversee the daily operations of the childcare centre. Directors ensure a safe and educational environment for young children, manage the childcare team, develop curricula in coordination with educators, enrol families, communicate with parents, and uphold the centre's ethos and national legislated requirements (Australian Government Department of Education Employment and Workforce Relations, 2009; ACECQA, 2018). They have a central role in influencing children's nutrition. Yet, understanding how directors view their role and influence nutrition-related practices is an understudied area in the literature. Exploring this further could provide valuable insights into the barriers and facilitators for the translation of evidence-based guidelines into practice.

Therefore, the purpose of the present study was to conduct an in-depth qualitative study to examine; (1) the experiences and perceptions of childcare directors relating to nutrition and (2) the factors that influence directors' nutrition-related decisions.

## 5.2. Method

### 5.2.1 Recruitment and sampling

Using maximum variation sampling, directors were purposefully invited to participate from a range of childcare centres across South Australia. Childcare services included not-for-profit centres, private centres from the three main enterprises, and metropolitan and country-based centres. The considerations used for determining which centres to interview are

presented in Table 5-3: Sampling rationale for selecting centre-based childcare services for director interviews, South Australia. Care was taken to include centres from the outer southern and northern metropolitan areas where centres were relatively new and in areas of relative disadvantage according to SEIFA. Consistent with maximum variation sampling, directors were invited to participate from centres where cooks were previously interviewed and from centres not previously approached. An invitation was emailed to directors followed by a phone call to arrange a face-to-face interview convenient to the director. Directors were provided with an information sheet and a letter confirming ethics approval from DECD and Flinders University (Appendix 3).

**Table 5-3:** Sampling rationale for selecting centre-based childcare services (n=13) for director interviews, South Australia

<b>Geographical location</b>	<b>Private centres</b>	<b>Community not-for-profit centres</b>
South	Private centre in outer southern area, low SEIFA, new Private centre in semi-rural area, long distance commuters Private centre in largest expanding geographical area, low SEIFA, new Private centre in southern area, low SEIFA, new	Well established, low SEIFA area Well established, vegetarian centre
Central	Private centre, inner city, new	Inner city, most culturally diverse in SA Best practice centre, outer city
North /West		Well established, low SEIFA, vulnerable families Well established, area with many migrant families
Country	Private centre, southern regional town, new	Southern regional centre supporting many with children with additional needs

### 5.2.2 Data collection and interview schedule

Semi-structured questions were used with an interview schedule that was informed from the previous study interviewing cooks plus the literature review of nutrition-related studies with directors (Lanigan, 2012; Lyn, Evers, Davis, Maalouf & Griffin, 2014; Lynch & Batal, 2011, 2012; Otten, Hirsch, & Lim, 2017; Ray, Määttä, Lehto, Roos, & Roos, 2016). Open-

ended questions explored directors': understanding of healthy eating; their experience and perceptions of how their centre supported healthy nutrition; perceived barriers and facilitators to supporting healthy nutrition in the centre; and the perception of children's rights and directors' experience with parental engagement. Directors were also asked what strategies were needed to strengthen healthy food habits in centres. The interview schedule was piloted with a director, and no changes were suggested. After the sixth interview, two additional questions were added to explore emerging areas of interest. This included asking what was 'key' to enabling the strategies mentioned by directors and what differentiated 'exceeding' examples of nutrition practice from those that were considered standard (Table 5-4: Interview schedule for centre-based childcare directors exploring factors influencing nutrition-related decisions). Consistent with grounded theory, findings from the cooks' study was shared with the directors. Interviews continued until saturation when no new information or emerging themes were forthcoming (Namey et al., 2016).

**Table 5-4:** Interview schedule for centre-based childcare directors exploring factors influencing nutrition – related decisions

Aspect Addressed	Interview Questions
<b>History working as a director</b>	Can you please tell me what made you become a director?
<b>Meaning of healthy eating</b>	When you hear people talking about “healthy eating in children aged 2-5 years”, what does this mean to you?
<b>Factors that facilitate or constrain decisions</b>	How does your centre support healthy eating for children aged two-five years? What makes it easier for healthy eating in your centre? What are the challenges in providing healthy food? When you hear mention of ‘government standards’ or ‘healthy eating guidelines’ what do you think of?
<b>Perceived role and responsibilities</b>	Who has the responsibility for children’s food and nutrition in your centre? What is key to enabling these strategies you have mentioned work? What entitlements or rights do you think children have about the food and nutrition in child care?
<b>Influence of policy</b>	Nutrition is one of the standards in the NQS (bring copy), what is your understanding of this? How do [DECD/ G8/GoodStart/Stepping Stone/etc] support your centre with healthy nutrition?
<b>Parental engagement</b>	How do parents engage with nutrition and food at the centre? What about parents’ roles and responsibilities? Many cooks believe xxx, what is your opinion on this?
<b>Recommendations for enablers to support healthy eating behaviours in children</b>	Can you describe what ‘exceeding nutrition’ standards would look like? What do you think is needed to support centres with providing and promoting good nutrition to children? Are there any other comments or anything you have said that you would like to add or change?

### 5.2.3 Data analysis

Interviews were audio recorded and transcribed verbatim. Data was inductively coded using the process described by Hsieth & Shannon (2005). This process continued until no new codes were determined and the codes are described in the codebook (Appendix 8; codebook example for coding of directors’ interviews). Taking a socio-ecological approach

(Sallis, Fisher and Owen, 2008), codes were organised into categories describing interactions at different levels of influence. In discussion with my supervisors, themes were subsequently developed in keeping with the six-step process described by Braun and Clarke (2006) and by Creswell and Poh (2017). Themes are described in the results section and supported with illustrative quotes. To ensure anonymity, each director was given a pseudonym (e.g. Director-10).

## 5.3. Results

### 5.3.1 Participant characteristics

Thirteen directors were interviewed from a diverse range of 13 centres, and the directors' characteristics are listed in Table 5-5. All of the directors were female with an average of 18 years of ECEC experience (range 7-30 yrs), and an average of eight years as a director at the current site (range 1.5-28 yrs). All the directors had previously worked as educators for several years in various centres. Six centres were private businesses and belonged to one of the three childcare enterprises. Seven centres were not-for-profit and included an interview with the director who manages five Tertiary and Further Education (TAFE) centres. These centres included a childcare site in Adelaide's central business area, a centre in the western suburbs with a high migrant population, a centre in a low SEIFA area in the northern suburbs, and centres in two regional cities in rural and remote South Australia.

Three of the centres (all private businesses) were less than three years old and 'working towards' meeting the National Quality Standards. Two centres were in a regional town 85 km south of Adelaide and the others in diverse metropolitan areas, including the outer south with new families in a relatively low SEIFA area. Directors were interviewed at eight of the same sites in the previous study. The other five centres included a private centre in a regional area, a centre in the largest expanding area in SA which is also low SEIFA, and another centre with children from a diverse range of cultures in western metropolitan Adelaide. Also included was a well-established centre supporting families of extreme disadvantage and a best practice centre which offered professional development and



familiarization visits to the sector. There was an even mixture of centres ‘working towards’, ‘meeting’ or ‘exceeding’ the National Quality Standards (i.e. accreditation ratings).

Interviews took between 28-58 minutes, typically more than 40 minutes.

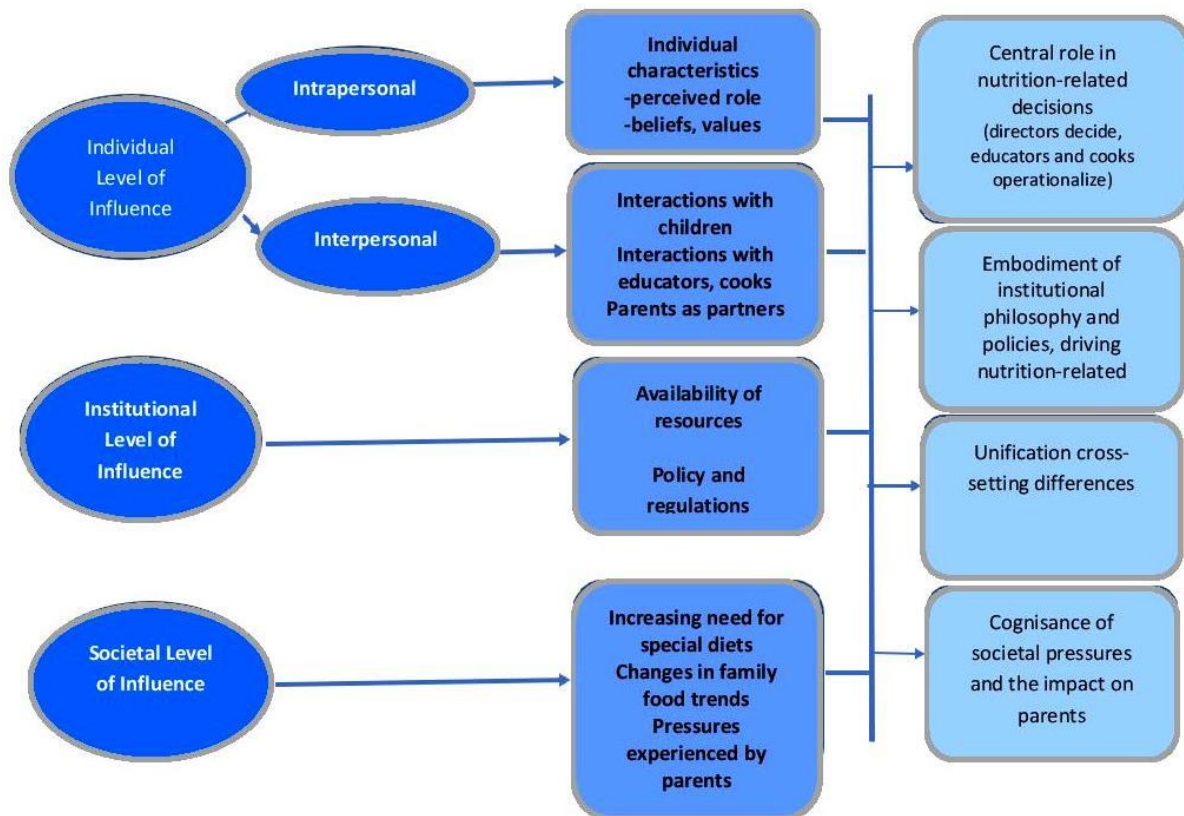
**Table 5-5:** Characteristics of 13 early care and education directors (n=13 centres) participating in semi-structured interviews exploring factors that influence nutrition and food-related decisions, South Australia

Characteristic	Data
<b>Provider</b>	
Female	13
Experience, mean years in current role (range)	8 (1.5 years-28 years)
Experience, mean years in childcare sector (range)	18 (7 years-30 years)
Age, mean years (range)	47 (32-58)
Not-for-profit	47 (32-56)
Private	40 (37-48)
Highest education level attained	
Diploma, Certificate	8
Bachelor’s Degree	4
Post-graduate Degree	1
<b>Site</b>	
Centre type (n)	
Not-for-profit	7
Private	6
Number of places for children, mean (range)	
Not-for-profit	86 (50-143)
Private	86 (60-137)
Foods service provided (n)	
Cooked on site, lunch and mid-meals	11
Cooked on site, breakfast, lunch, dinner and mid-meals	2
Accreditation rating	
Exceeding	5
Meeting	4
Working towards	4

### 5.3.2 Findings from interviewing directors

A range of factors were identified which influenced directors’ nutrition-related decisions as well as a range of sources of those influences. Seven sources were identified including children, educators, cooks, parents, workplace, regulations and policy, and directors’

characteristics. Four levels of influence were derived: intrapersonal (individual characteristics of the director), interpersonal (interactions with children, educators, cooks and parents), institutional (workplace characteristics, regulation and policy influences), and societal (changes in food trends), as depicted in Figure 5-2 (Levels of influence and themes from interviewing directors).



**Figure 5-2:** Levels of influence and themes from interviewing 13 centre-based childcare directors exploring factors which influence decision-making relating to food and nutrition, South Australia.

### 5.3.2.1 Intrapersonal: directors’ characteristics

Directors' characteristics, including their understanding of their role, beliefs and values significantly shaped nutrition-related decisions.

#### *Perceived role*

Directors influenced nutrition at every level in their centre, and this reflected the broad scope of their role. All directors were actively involved with the cooks in menu planning,

developing new menus, determining the food budget, problem-solving food provision issues and taking responsibility for the safety of the menu (e.g. allergies). All directors worked with the cook daily on various tasks as described by this director:

‘so, myself and our assistant centre manager – work in collaboration with [cook’s name] in the kitchen as well and we do menu reviews. So, the educators from the classroom can give [cook’s name] feedback on meals that children enjoy or don’t enjoy and then we make modifications based on that information’. (Director-2)

Of all the positions in a centre, the director was the primary person that engaged with parents. All the directors described discussing their child’s food preferences with parents, food-related needs and the centre’s healthy eating policy and food-related practices on enrolment. This director expanded on the centre’s mealtime practices that were discussed with parents when enrolling their child:

‘we do discuss mealtimes and what they look like here in terms of we have progressive morning and afternoon teas where children can kind of come and go over a period of time rather than everyone must sit down and eat at once and that can be a little bit different for families to see, but we also explore any kind of dietary or health needs that their children might have and how that might be catered for here and any kind of religious preferences and things like that that people might have too’. (Director-10)

Directors also discussed any nutrition-related concerns with parents raised by them or by staff, such as food refusal, allergies, and introducing solids and weaning. Directors enquired about children’s routines at home and mindful of supporting the parents’ parenting style.

All directors described supporting educators as positive role models and skilled practitioners who managed food-related behaviours. Furthermore, directors worked with educators, planning a curriculum that included a focus on nutrition and food literacy, such as a suite of ‘paddock to plate’ activities starting with vegetables grown in the centre’s garden.

All the directors were involved with tailoring their centre’s local healthy eating policy to suit their families through their parent-led management committee or if they were a private centre, through the central office.

While directors credited the enactment of nutrition practices as a team effort, when asked who or what enabled positive nutrition practices in the centre most directors acknowledged that they were central to this happening. One director, who reflected on this commented, 'How cool is that? I think we build a culture; we're building a culture. It hadn't just happened. We've built it'. (Director-6)

### *Beliefs and values*

Directors' perception of their role and regular interaction with cooks, educators and parents was profoundly influenced by their beliefs as described by this director:

'So, it's not just making sure that their [children] physical development is being met in terms of exercise and outdoor play. It's not just making sure that they're having social opportunities and experiences and are making friendships and connections [...]. It's a holistic view of the child and supporting all of children's learning and development and working in partnerships to do that. And I think if people are working with children for the right reasons, that isn't just making sure they're meeting all their developmental milestones and all that sort of thing, it's also making sure that we're helping them to grow and be the best version of themselves, and that includes healthy eating'. (Director-9)

Directors fully supported healthy nutrition as a priority for children as shared by this director, 'I think it's a right to have food and then for that food to be the most nutritious food that we can afford to provide' (Director-6). Directors belief of healthy eating was holistic and their definition of healthy eating included: choice to empower children, eating as a social group with conversations about food, mealtime and food experiences so children develop a positive relationship with food, never forcing or pressuring children to eat, strategies which enable children to learn to self-regulate their food consumption, strategies which help children develop independence, education about where food comes from, and knowledge about why healthy eating is essential, as well as the provision of healthy food. This example relayed by a director highlights this broader view of healthy eating where the director is describing the practice of serving the ingredients of a mixed meal (tuna in a cheese sauce, rice and vegetables) in separate bowls so the child can independently serve themselves and choose what parts of the meal they like and the proportion according to their appetite:

‘we’ll get comments from families if we have tuna mornay here that they won’t eat tuna mornay at home and so we talk to families about how they offer tuna mornay at home ‘cause we would offer tuna mornay in a dish by itself and then have a carb option like rice or pasta separately and then say, a vegetable option separately as well, so the children can actually just pick out one bowl that they want out of one option or they might choose the proportions of what they want. So they might have a lot more pasta and a smaller amount of tuna mornay or something, whereas a lot of families tend to kind of either pre-dish things for their children, so the children actually don’t have choice in what they’re getting or it’s kind of all mixed together and it’s harder for them to kind of get the proportions that they want for things that they want to eat’. (Director-10)

Two directors linked what the centre provided with their own health concerns or own beliefs about food, including weight management and what they provided for their family, making food a personal part of childcare.

Notably, all of the directors spoke of children’s experience of food and nutrition as being a cornerstone to children’s health with directors saying that nutrition in childcare is ‘setting foundations for children for lifelong eating’ (Director-4). This belief and long-term holistic view of nutrition was explained by a director in a low SEIFA area:

‘It’s important to explore with children the things that are going to benefit their bodies, but also supporting them to make healthy food choices moving forward and understanding why that’s important for themselves. I guess so that they’re not constantly in this cycle of families being – yeah, children and families being brought up on eating junk, for want of a better word, that they learn to have a better and a healthier relationship with food’. (Director-9)

### *Perceived responsibilities*

When asked who was responsible for children’s nutrition in childcare and enacting these beliefs, all of the directors attributed this as a ‘collective responsibility’ including the centre’s management committee, the director, educators, cook, children and parents. One director qualified this as ‘I don’t think there is any one person that holds that [the

responsibility]' (Director 10), and many directors acknowledged that 'it's up to all of us' (Director-2). Directors perceived this collective responsibility seriously and some directors spoke of it as a child's entitlement, 'we need to make that ten hours a day the best ten hours that we possibly can. We need to give them all these opportunities' (Director-6). A few directors reiterated this opinion as a child right, 'I think we all play a part in ensuring our children [have healthy food]...and it's their right' (Director-6). One director expanded on this shared view:

'We can't fulfil our other rights to children, the rights to learn and the rights to play and the rights to be with peers if we can't concentrate because we're hungry or we hadn't got the energy to do those other things'. (Director-6)

The difference between rights and responsibilities was articulated by a director as, 'The children have every right, and we have every responsibility'(Director-3). Another director elaborated further with regards to nutrition:

'I think the children have the right to choose what they're putting in their own body with the guidance of an adult. So, we have really firm views around here that children have rights, but they don't hold responsibility by themselves. So, there are responsibilities that come with rights, but children hold those responsibilities in partnership with an adult. So, they have the right to choose what they wanna put in their body, but they have responsibilities about making healthy choices, so an adult will help them to make the healthy choices'. (Director-10)

This belief contributed to a holistic view of nutrition, which directors clarified did not mean that children could make choices without guidance:

'There are a lot of people that get worried about children having rights and there'll be chaos if children can just do whatever they want because they have the right to, sort of thing. So, it's really about putting that back into perspective of holding the responsibility in collaboration with an adult and what that looks like and children having the right to make choices that affect them and be involved in making decisions that affect them'. (Director-10)

This view was common to most directors:

'I think they are entitled to us providing them with healthy food options, that they are entitled to not go hungry. If there is something they don't wanna eat, that they are entitled to an alternative meal. I don't believe a child should ever be made to feel bad for not wanting to eat. They shouldn't be forced to eat, and we try as much as possible, especially with the younger children, to work around their routine at home. So, if at home, they eat lunch at 1:00 and they're asleep at 12:00 – well, we wouldn't wake them up to feed them. So, we – yeah, try and follow those routines from home as well'. (Director-8).

### **5.3.2.2 Director led practices**

#### *Strategies for children promoting self-regulation, choice and independence*

Strategies described by directors that aligned with enabling children to be independent, self-regulate their eating and have choice included progressive mealtimes where children choose when to eat and 'no-pressure' eating which respects children's choice not to eat or to refuse particular foods. The ability to self-regulate their food consumption rather than eating in response to external cues imposed by a schedule was highly valued. In this example a director explains how progressive mealtimes work:

'we don't do it so much for lunch, but all the rooms have a progressive morning or afternoon tea where the food service trolley comes from the kitchen and is out for one to two hours. So, we don't kind of say, "Okay, everybody, it's morning tea, you have to stop what you're doing and come and eat all together now." It's – children will come to it as they kind of feel like they need to. So, educators will keep an eye on who hasn't accessed morning tea for the morning and might just tap someone on the shoulder and let them know there's another 15 minutes left before the trolley is going if they still wanna have something to eat'. (Director-10)

In this example, the children are given the right to choose when to eat and how much and the educators take responsibility for monitoring and guiding the children to eat if they want to.

Providing children opportunities to serve themselves, make sandwiches and select foods from meals with ingredients served separately, was perceived as giving children a choice and fostering independence. To foster independence, children were encouraged to serve themselves and make simple meals as related by this director:

‘so the kindy room make their afternoon tea a lot with the educators, so if they’ve got sandwiches then they’ll make their own sandwiches so they’ll have all the spreads and things like that and they’ll learn to butter their bread and some are better than others. So you might have a vegemite sandwich that has a massive blob in the middle and it’s like “Okay, let’s work on the skills of spreading it more” sort of thing, but we find that if they’re making it themselves then they’re actually eating more than if it’s already premade in that kindy room – which is always good then ‘cause they’re putting the onus back on themselves of like “Yeah, I’m gonna put this together and I’m gonna eat that”’. (Director-1)

Giving choice to children was paramount according to directors but within the boundaries imposed by the educators. Educators’ were expected to guide children’s awareness of appetite as explained by this director when children appear to be over consuming:

‘if they’re going for four or five bowls then educators’ sort of step in and go “Let’s let your body realise that you’ve actually eaten and let your body process that you’re not actually hungry. You’re just eating it for the sake of eating it.” So, they’re pretty good on that and they’ll keep track of what they’re eating and how much they’re eating and things like that as well’. (Director-1)

Although directors shared the view that children had rights and adults shared the responsibility, the application of this within a nutrition context was not explicit or documented and directors’ understanding of choice varied. For two directors, parental requests for a vegan diet for their child challenged their view of choice and children’s rights:

‘We’ve got some parents that will say, “Look, we’re vegetarians. My child hasn’t eaten meat but I’m happy for you to try, but if they don’t eat it, please don’t force her,” and there’s that and I think that’s great because it should be a child’s choice, and I think from a personal view, that’s where I struggle because I don’t think a child



should be made to live with the decision they haven't had a choice to make'.

(Director-5)

#### *Broader purpose*

For a few other directors, healthy nutrition was linked to a broader purpose, 'I think we're developing these people to [be the] next citizens of the world so we need to really make them ready' (Director-3). To do this, some directors believed that they had the responsibility to share their knowledge relating to nutrition with 'those that don't' (Director-9) including the children and their families. One director described this as, 'It's our duty to share that knowledge. We just can't keep it to ourselves. What use is that?' (Director-9). For another director, sharing this knowledge was central to giving children every opportunity to develop healthy eating habits as it could not be assumed that this would be done at home:

'You have to give them the best that you can.... At home, I guess you can give them whatever you choose to, that's your decision, but these aren't our children. So, we've gotta educate them the best way that we can 'cause some of them don't have that opportunity. A lot of them know where McDonald's is, I'll tell you now'.

(Director-7)

#### **5.3.2.3 Interpersonal: children, educators, cooks and parents**

Although driven by their shared beliefs, nutrition-related decisions by directors were mainly in collaboration with cooks, educators and parents. Interactions with the children were indirect and, decisions made by the director for the benefit of the children, focused on establishing healthy eating food and social environments and positive nutrition-related practices.

#### *Children: meeting nutritional and broader developmental needs*

When describing factors that directors considered as supporting healthy eating, all of the directors spoke of food meeting children's nutritional needs for growth and development, including offering variety for developing lifelong healthy food preferences. Most of the terms used by directors when describing healthy eating reflected national dietary guidelines and knowledge of children's nutritional requirements. Directors used phrases such as 'lots of variety', 'nutritionally balanced', 'provides 50% nutritional intake over the day, low salt,

low fat, low in sugar' and 'no processed stuff', 'made from scratch', 'fresh produce'. These views were consistent with the Australian Guide to Healthy Eating (NHMRC, 2013) and the Australian Dietary Guidelines (NHMRC, 2013b). Terms such as 'no processed stuff' can be subjective and a few directors implied that highly processed foods were less nutritious, which reflected a common consumer belief reported in recent studies (EUFIC, 2016). As well as providing a health-promoting menu, eating as a social group at mealtimes was seen by directors as an opportunity for children to: experience varied foods and to experiment; to observe healthy food choices and role model food preferencing; and to learn social behaviours from educators and peers, reinforced with conversations about food:

'it's so different for children eating at home to eating here because it's such a big group kind of social occasion where they sit around and kind of talk with their friends about what they're doing, and I always feel like children are much more inclined to eat more here because their friends are eating with them and next to them. But I also think the educators being part of that mealtime experience is really important as well and children tend to eat more when they're surrounded by other children and adults that are eating'. (Director-10)

#### *Children: meeting food literacy needs with intentional teaching and education*

Mealtimes and similar group occasions were used as intentional teaching opportunities, providing food literacy and elaborating on the importance of healthy food. Most directors spoke of food and nutrition-related activities as part of the curriculum, with children in one centre making bread for the younger children every week and many directors describing gardening and cooking activities:

'So, we do a lot of cooking here, and children do cooking. We do have a garden that we can harvest things from and cook them. We've had beans and things like that that was just cooked and – harvested and cooked, and children had it for afternoon tea. It's not a lot but at least they can see where things are coming from'. (Director-2)

#### *Educators: recognising expertise*

Key to supporting healthy nutrition in the centre, according to directors, were the educators and cooks. All of the directors had worked as educators in the rooms with the children and,

as they were responsible for them, had high expectations of their educators. . Directors attributed children's acceptance of the menu, attitude to food and food literacy to the skills of the educators:

‘Educators are really powerful and can influence children quite heavily. So you can have a table that will eat with one educator on one day and won’t eat anything, but with another educator on another day and eat all foods’. (Director-6)

Highly skilled educators were reported as effortlessly providing intentional teaching, facilitating conversations with children and managing children’s food-related issues, such as food refusal, and food pickiness. This director described how educators responded to children’s interest in restaurants and incorporated this into teaching activities which children continued during their play:

‘..the educators at times, they always sit with the children at mealtimes and if the discussions come up about different foods or cultures or things like that, it’s often extended on by the activities that they’ll set up in the room. So, at the moment, in the kindy room, I think they got to talking about restaurants and things like that. So they have the children really involved in setting up the meal space, so setting the table and serving the other children and they talk about it in their room and then when they’re out in the sandpit, they’ll often mimic that behaviour as well throughout their activities throughout the day that are separate to meal times’. (Director-2)

With concerns such as food refusal and food pickiness, and with providing nutritional guidance to children, directors expected their educators to know each child well and to manage situations skilfully. When describing the behaviour of a child with considerable limited food preferences, this director emphasised her expectation for the educator to manage the situation:

‘I think as an educator, you should know your children. That’s the whole point. Some children, [are] in five days a week, they’re in from 6:30 to 6:30 and they’re here more than they are at home, and let’s be honest, so there is an expectation that, well that’s my expectation, that the educators know those children and they know [...] how far they can push it.’ (Director-5)

A few directors acknowledged that not all educators shared a productive attitude. A negative attitude towards unfamiliar foods by educators could influence children adversely. A director related how a simple non-verbal from an educator was a cue to children not to accept a new recipe:

‘...“Oh, the children don’t eat this,” and if you say that, then the children hear you, they hear, they know. Or if you screw your face, you sink your shoulders, or you look at the menu – they’re very clever. So, if you eat a spoonful and smile about it regardless of how you feel, you probably got a better chance of them eating it.’

(Director-6)

One director was sympathetic to how educators can unknowingly influence children’s food preferences through educators’ attitude to food:

‘Anyway, I think educator attitude is a barrier, I do. And you can move people along and you can educate people and you can talk to people but if you’ve had 50 years of eating white bread and cheese, it might be quite difficult to eat grainy bread and beetroot dip.’ (Director-6)

#### *Cooks: expertise, challenges and constraints, training and support*

As well as educators, all of the directors worked on a daily basis with their cook and valued their cook’s expertise. This was made clear by one director who said: ‘I believe a cook can make or break a centre to be really honest’ (Director-12). Being able to provide a large number of age-appropriate and healthy meals, flexibility with changing the menu at short-notice and applying their knowledge to cater for special diets as well as nutritional requirements were skills valued by directors. Several directors made statements such as:

[Cook’s name] is fabulous. ... You need someone who can be flexible to cater. I mean how many people are coming here who have experience in catering for 112 children a day with a third of those having dietary and nutrition requirements in one hit? It’s a really special skill set to find’. (Director-10)

Directors emphasised the importance of recruiting cooks with appropriate qualities as well as finding suitable training, as elaborated by this director: ‘we, as a centre, are providing her with training opportunities so that she can know all the current industry information around healthy nutrition for children’ (Director-2). All of the directors described searching for

training opportunities for cooks, and a few directors had undertaken menu-planning or similar training themselves.

Trends which directors acknowledged as challenges to cooks were: foods in the centre being different to those at home, some children only eating limited foods, such as white pasta when meal ingredients were served separately, and the increasing number of requests for individual meals due to a rising number of allergies and family cultural food preferences.

The increase in dietary requests was recognised by many directors as the most significant challenge with one director explaining the impact on their cook, 'if it's a child that's lactose intolerant, instead of having a milk-based sauce, they will have maybe a tomato-based sauce. So, he'll cook a separate meal for that child. So, it's extra work' (Director-8). Several directors recognised that while there were 'ridiculously high' numbers of food allergies and that when they started as directors an allergy 'was almost non-existent compared to what we have these days' (Director-5), cooks were believed to be managing these challenges well:

'I just feel like there are now larger numbers than we've ever had, and [cook's name] job starts to get incredibly complex when she's working out the children who are gluten-free, dairy-free, on FODMAP diets, and all of those sorts of things when we have 112 children a day – can get pretty full on, but she has some great strategies in there for dealing with that'. (Director-10)

The extra work of providing for a diverse range of dietary restrictions was also challenging because of the need for mealtimes to be inclusive. A few directors spoke of the dilemma of restricting the entire menu for a few children with serious allergies so that children with dietary requirements did not feel excluded, such as a nut-free or milk-free menu. Directors believed that children should have food that looked similar to what was served to most children. This director gave an example of the cook's concern for foods being inclusive:

'she was concerned that this little person wasn't being included, that they were kind of been separated just by their food, by the fact that they have a different lifestyle, different beliefs that their food looked very, very different. And it can be a challenge for [cook's name] to come up with something that is vegan but is adaptable so that

it's still okay for everybody else as well, but she's managing really well'. (Director-12).

Many directors also acknowledged requests for additional meals because of changing family food preferences which were cultural (e.g. exclude garlic, onion, beef or pork for religious reasons) or reflected family preferences for lifestyle reasons, such as vegetarianism, veganism or avoiding food types such as wheat or foods associated in the popular press with causing gastrointestinal symptoms of bloating and pain. One director described the complexities of providing additional meals for family preferences as stressful for cooks:

'the price for the wages for a cook aren't enough if you think about the amount of stress they're under because you've got so many children, and over the course of the ten years that I've been a director, the amount of allergies have [increased], some were medical but some are purely a personal choice from the parents' perspective, so you've got children that are vegan, vegetarian, that kind of stuff'. (Director-5)

Some directors perceived requests for additional meals without a medical basis as a frustration for cooks as relayed by this director:

'So, I think she gets a little bit frustrated when the parents just go "Oh no, I don't want them to have that. Can you make them something else?" So, she's like "I'm already making stuff for 50 children and now I've gotta make more". (Director-1)

While acknowledging the task was difficult, directors did not feel an urgency to address this. A few directors speculated that each annual cohort of children is different and that next year there may be fewer allergies and different family food preferences. Most directors had confidence in their cooks to cater for changing food preferences. Only one director was considering the need to make changes to the centre's menu given the exponential growth in additional dietary requests:

'we're like, "Do we continue making ten additional meals that are gluten-free or do we actually just make our menu more inclusive for those families so that the children can all eat the same thing?" So that's where we're going with it at the moment'. (Director-2)

Cooks were given responsibility for food provision, but directors expected cooks to be flexible and to cater for parental dietary requests while also fulfilling a duty of care for the child to eat healthily. While sympathetic to the pressures experienced by cooks, not all directors believed that their cook was managing these challenges. Requests for menu changes were the catalyst for a few directors to mention constraints, such as cooks being 'set in their ways' and resistant to trying new menus, or foods unfamiliar to the cook but eaten by children outside of the centre. One director gave an example of how her long-term cook was resistant to change:

'It's so hard to find cooks because if you get an older one, they like their old ways. I mean our cook today has been doing it for many years and she will still say after all the years, why can't we just have pasta because it's so easy to do and I was like, "Well, no, because we need to be doing more. These children are going out, they're seeing all these different flavours, let's bring some of that in and some of those children that don't get those opportunities because money is tight or whatever, why should they miss out?"' (Director-5)

This director was speculating about the skills needed by cooks in the near future:

'So, who knows when [cook's name] goes, or these new breed of cooks that are coming into centres who have a different view and a new list of different recipes and things like that – yeah, it'll be interesting'. (Director-1)

Cooks in a rush to complete their tasks were perceived as a barrier by a few directors. Being driven by a schedule rather than being child-focused was a constraint, for example, one director related how cooks hurried mealtimes to complete their clean-up when mealtimes are encouraged to be peaceful and relaxed, 'it's pretty uncomfortable and the children are being rushed and it changes your practices and that's not okay because that's not what we value'(Director-12).

### *Training and support*

A constraint expressed by most directors was the lack of training available to cooks. Many directors described efforts to find suitable training frustrating since training was not accessible or affordable. Training was not a universal concern because private centres received training for their cluster of centres from Nutrition Australia, annually or every two

or three years. For not-for-profit centres and older private centres, Start Right Eat Right, the multi-strategy nutrition incentive award scheme implemented until 2013, was ascribed as enabling cooks with the necessary knowledge and skills.

Most directors raised concern about corporations providing fee-paid training, which impacted the availability of training from Gowrie (previously the primary provider of professional development in the early childhood sector). Additionally, directors also relayed that online training and menu related programs were problematic for cooks. Directors reported that cooks were averse to using new technologies other than searching for recipes online and had a preference to share experiences face to face with other cooks.

Suggestions for professional development for cooks are listed in Appendix 9 (Professional development suggestions from centre-based childcare personnel). A few directors did recognise that cooks could learn to use online programs however face-to-face training provided opportunities to learn from their peers, share experiences and offer and receive support, which directors said cooks valued. Notably, a few directors suggested adding short qualifications such as training in early childhood nutrition and attributes (e.g. flexibility to alter menus, ability to provide large-scale meal provision) to cooks' job specifications. Directors commented that several cooks came from working in aged care facilities and, although it was food-related work, the cooks found that the skills were not easily transferrable to a childcare setting and would benefit from training. A few directors suggested that the ideal would be to employ a chef, who is part of the teaching team, and could then attend staff meetings and educate the children through cooking. Directors with chefs spoke highly of their technical skills to manage large numbers, flexibility with the menu, and interest working with the children: 'we are blessed with a chef who is magic at catering for all of that sort of stuff' (Director-10). Some cooks had childcare qualifications as educators, and while a few directors found the flexibility of cooks to work between two roles advantageous, especially when educators were away on leave, some directors didn't find this arrangement ideal.

#### *Parents: partners to be supported*

Working in partnership with parents was recognised as central to supporting children and their nutrition by all directors. Building a positive and trusting relationship with parents was



seen to be paramount, and many directors described considerable investment of their role in this:

‘I guess one of the key parts of our philosophy for our organisation is about having relationship-based approaches to things, particularly between educators and children, but also educators and families, and of course to have healthy relationships that work in the best interest of children, there has to be that good communication and openness and coming together with the expectation that everyone has the best interest of the child at heart’. (Director-10)

Of significance, was the view that it was a partnership, and not ‘they’re poor parents and they’re poor participants of this, and they’re needy’ (Director-3). Children's food intake was communicated daily with parents through the educators and menus prominently displayed (or in some centres, emailed to parents each week). The director encouraged parents to discuss any food-related concerns. The relationship and open communication with families and parents were attributed to enabling this to happen:

‘...once you’ve got those relationships with them, they’re fairly open to it. So, you can ask them, “What do you do at home?” ...And I think if you have that open communication from the start, then most of the conversations flow’. (Director-1)

This director’s explanation of how a positive relationship is established with parents was shared by all directors:

‘I find that if you have a good relationship with the parents, if you connect to them and show genuine interest in what is happening with them, then that trust is there and they’re happy to talk about their challenges and as well as hearing, perhaps, some of the suggestions from our professional staff here’. (Director-3)

Directors described food practices in centres that were intentionally like those at home such as parents guiding weaning onto family-style foods and, in some centres, offering flexible timing of mealtimes. One director elaborated on putting food aside and serving it 45 minutes later:

‘we state with families that we try and stick to a very similar routine to what they have at home so that helps settle the children especially down in our younger age groups... So, we try to work in with the families as much as we can’. (Director-1)

Directors universally stated that parents approved of the centre having a healthy eating policy and those parents appreciated that their children were fed nutritiously. Having a healthy menu enabled a quick meal at home to suffice:

‘I guess a lot of the parents here know that if their child’s come, they’ve had a hot cooked lunch with veggies. If they have baked beans on toast, it kind of balances it out’. (Director-1)

Parents, according to most directors, also appreciated having meals provided by the centre, with some centres extending this to include breakfast and dinner as well as lunch. One director described how providing cooked meals supported time-poor parents:

‘And parents seem to love it, that the meals are provided for them. There’s that peace of mind knowing that someone’s doing it for them, one less thing for them to think about’. (Director-11)

Notably, some directors did not always give parents a copy of the healthy eating policy to avoid overwhelming families with information. However, the policy intent and food practices were made explicit when families enrolled.

#### **5.3.2.4 Cross setting differences between the centre and home**

Barriers to healthy food practices stated by directors included: food provided at the centre being different to that at home and not being accepted by a few children, children mirroring food refusal and some children consistently eating only one part of a meal served separately. Furthermore, barriers to extending healthy food practices to the home included: a lack of nutrition-related knowledge in some parents, parents being time-poor and some families experiencing food insecurity.

#### *Unfamiliar foods*

Directors cited unfamiliar food being distressful for children, and a few directors saw a disconnect between what was provided in the centre and what was provided in some homes;

‘I think it can make it quite difficult for children if they’ve not been provided nutritional meals at home once they’re enrolled in care. If they’re seeing foods – fruits and vegetables that they’ve never been exposed to at home, it can make it quite distressing for them’. (Director-9)

Making the centre-experience a positive one for children was important to directors. Educators having conversations with the child, peer role modelling, encouragement and no-pressure exposure to centre foods mitigated the issue, but not always. This director reiterated that they want to support family practices and minimise distress caused by differences between the centre and home:

‘We don’t ever want children to be distressed around food or mealtimes and I think that makes a big difference in the children as they progress through the babies’ room on to the toddler and kindy room. If we’re not making food a giant big ordeal for them when they’re babies based on their parents’ sort of input, then they’ll develop healthy eating habits’. (Director-2)

Children copying other children (mirroring) who refused food because the food was unfamiliar, or because of a preference for limited food choices was another barrier relayed by directors. Providing meal ingredients separately was described as an opportunity for children to make choices and learn skills to become independent. While seen as a strategy that empowered children and recognised their right to make choices, some directors relayed that some children only ate white pasta or white rice. Monitoring by the educators, conversations with the child, encouragement and no-pressure exposure, again mitigated the issue but not always, ‘So, if one of the children in the room says, “I don’t want this. Can you make me a sandwich?” then they all want a sandwich, regardless’ (Director-8). Other directors had similar experiences:

‘But, then there are other children who flat out refuse. They don’t want their foods mixed. So, they don’t want the sauce and the rice or the pasta or the vegetables in the same bowl. They only want one at a time and they only want one part of the

meal. They don't want all the parts of the meal and so we don't withhold food from them, but we do strongly encourage them to try whatever it is that's on the menu first'. (Director-9)

Directors attributed the discrepancy between what was served at the centre and what children were familiar with at home to factors outside of parent's agency or a lack of knowledge:

'I think it's also the parent's responsibility to make sure that they are providing their children with healthy meals and food choices outside of the centre, and I know that that's not knowledge that every parent has– you only know what you know- and they might have grown up themselves in a family where eating chips and nuggets for dinner is okay three or four nights a week, whereas those with the knowledge – I think we also have a responsibility to share it with those that don't. And so, making sure that we're giving families that access to that knowledge and sharing that knowledge with them'. (Director-9)

### *Nutrition education*

A few directors viewed nutrition education as an opportunity to break a generational cycle where children learn dietary food patterns from their parents who learnt it from their parents, 'But they don't know – these parents don't know either though. They've been probably brought up like that. Do you know what I mean? (Director-12). Some directors started educating parents early, as described by this director advising on what foods to introduce to infants, 'we try to start to educate really early and I just think it's because [parents] don't know, or it's convenient, or [parents] are too busy, or all those types of things. So we do try to educate early'. (Director-6).

Many directors were sympathetic to parents being time-poor and rushed. They offered an extended menu which included breakfast and an evening meal, or take-home meals for the family made by the cook. These strategies were viewed as a means of support but also education as described by this director:

'We also support families ...to build their knowledge around healthy eating by providing take-home meals at the end of the day for them, so that we know that

what they're having at home is nutritious and it's not a quick drive through at Hungry Jack's at the end of the day, 'cause they can't be bothered cooking – they can grab something from here and we know that those families are able to get something nutritious in their bellies'. (Director-9)

As well as take-home meals and extended menus, some directors reported an advocacy role supporting families with other initiatives, such as arrangements for food from Foodbank (a non-profit food relief organisation) for parents to collect from the centre, and the provision of nutrition information, such as cookbooks with centre recipes adjusted for family sized-serves.

#### **5.3.2.5 Institutional: resourcing, policy influence**

Food practices are contingent on providing food services with adequate resourcing (budget and time allocation) and adequate kitchen space and equipment. Most of the directors held the view that cooks were managing well because they had adequate resourcing and facilities. Most cooks were employed for four hours a day with two centres increasing this to 8 hours per day in response to increasing menu demands.

Local healthy eating guidelines and the National Quality Framework (NQF) significantly influenced food-related decisions and practices. Notably, the NQS relating to nutrition (NQS 2.3.1) was rarely mentioned, nor the supporting government resources or websites suggesting directors felt confident in their understanding of nutritional requirements and nutrition practices. All of the centres had a food policy, and as part of this policy all of the centres were nut-free. The private centres enacted a policy developed by their central office but acknowledged that they had the flexibility to tailor the policy to their community. A healthy eating policy was perceived as an enabler by directors and stated that it was accepted by staff and parents.

Directors from the not-for-profit centres spoke of the influence of the EYLF on how they supported parents and food practices. Being child-centred, and in partnership with parents, meant supporting parenting decisions and practices at home while providing a duty of care to provide and promote healthy eating. Meeting parents' expectations while providing a duty of care for the child occasionally caused an internal conflict for directors as in this case

when a director described a request for special meals prescribed by naturopaths being refused:

‘So, we’re quite adamant about that and we’re more than happy then for them perhaps to go to another service where they’re happy to perhaps do that, ‘cause duty of care stops with us’. (Director-13)

For other directors the EYLF was useful as a directional document to check ambiguities in interpretation or beliefs:

‘Sometimes people will say “I disagree with this and that” – if I hear it, I’ll just say “Well, this is because it doesn’t sit with you as your own person...let’s check it against the centre’s values because that’s something that we work on.” And that’s very important for us to always come – go back to [policy]’. (Director-3)

In addition to the EYLF, directors from two of the three private enterprises were influenced by their organisation’s philosophy to support families in need. These enterprises developed from charity organisations had a budget to initiate strategies with parents, such as take-home meals which were subsidised or offered without cost.

### **5.3.2.6 Societal: changing food trends and pressures experienced by parents**

Parental concerns with allergy-free, gluten-free, or meat-free foods reflected broader consumer food trends including changes to what parents considered healthy eating. Most directors saw changing family food preferences as a long-term lifestyle change:

‘I think what’s regarded as healthy food for children has evolved quite drastically over the last few years, I feel like. There’s a lot of our families that are like, “Oh, we’re vegan, we’re vegetarian, and we’re gluten-free,” and so we’ve seen more and more children with those sort of – it’s like a parental preference, not so much an allergy’. (Director-2)

Parents being time-poor was another phenomenon observed by most directors here. Being time-poor was perceived as a reflection of societal changes on workforce participation:

‘Even 20 or 30 years ago, there was a working parent and a stay-home parent, but these days it’s – you’re either both at work, or one is at work and one is studying, or – and there just isn’t that much time for them to do a lot of that’. (Director-9)

Strategies to support parents who were time-poor included: take-home packs with ingredients for a family meal; free or subsidised meals provided by the cook and an extended menu that included breakfast and an evening meal. One director explained the rationale for providing take-home meals for parents:

‘I guess for those families who have children here for a long day, it’s late when they pick up. If they don’t have time to stop at the shops or they don’t have the strength to stop at the shops ‘cause they’ve had a really long day, they can go home, they can put the meal in the microwave ... or stick it in a saucepan on the stovetop, heat it up, and then they’re not slaving in the kitchen trying to put something together before they put their children to bed. That way they can also spend more time together as a family, so that it’s not eating into that family interaction relationship time’.  
(Director-9)

Furthermore, food from Foodbank (a welfare organisation that redistributes excess food from the food industry) was ordered and distributed from the centre at no cost to families as described by a director from a centre in a disadvantaged area:

‘We also provide Foodbank for families as well and through Foodbank, when we’re ordering the foods, we steer clear of junk where we can. It’s okay to have a treat every now and then, like for example, the other week, I ordered some ice creams to put in the freezer, but for the most part, its fruits, vegetables, bread’. (Director-9)

Moreover, some directors described some families using childcare as being food insecure, a phenomenon not mentioned in the Australian literature. Using the broader definition of food security (Gallegos, Booth, Kleve, McKechnie & Lindberg 2017) this included families where accessing healthy food choices were limited, as well as limited finances:

‘Money, I think, plays a factor as well. There’s some very low income families here that just don’t have the resources or the knowledge or – yeah, to do it’...I know that there are families in the area that do struggle financially and I’m just basing that on

the information that's been available to me through the socioeconomic data and just through knowing what families are recipients of Centrelink benefits and all of that sort of thing'. (Director-9)

## 5.4. Discussion

### 5.4.1 Central role of directors in nutrition-related decisions

By interviewing directors about their perceptions and experiences, the purpose of this study was to understand and examine the factors that influence directors' food and nutrition-related decisions. Through this research, it became apparent that directors had a central role in influencing nutrition-related decisions and therefore nutrition practices. Directors worked with cooks daily to ensure that the food provided was healthy and safe. They also managed and supported educators providing nutrition practices, assisted with developing a nutrition curriculum and regularly engaged with parents about their child's nutritional needs and progress. Directors did not work in isolation but actively engaged with educators, cooks and parents influencing a number of micro-environments within the centre including the food environment (food provision, menus), the social environment (mealtimes), and the information environment (intentional teaching activities, the curriculum, nutrition education directed at children and parents). Directors had a holistic view of nutrition and identified many opportunities to support children's healthy eating habits beyond foods served during mealtimes, consistent with findings from a Canadian study by Lynch & Bartel (2015). As such, directors influenced interactions and decision-making within several levels of influence, particularly the interpersonal level with cooks, educators and parents. Notably, directors also translated directional documents and accreditation standards, such as the EYLF and the NQF, which includes the NQS, into day-to-day practices for cooks and educators. It is imperative to appreciate that directors determined the nutrition strategies to be implemented within a centre, and cooks and educators operationalised it. Directors could be attributed with determining the nutrition culture of the service and were central to the translation of nutrition best practice into daily routines.



#### 5.4.2 Directors as the embodiment of the institutional philosophy and policies

Profoundly shaping these actions were directors' beliefs, including a sense of mission to foster healthy eating habits in children and an ideological commitment influenced by the EYLF which underpins the NQS. The sense of mission seen in directors in this study has been reported in the USA (Hirsch et al., 2016; Otten et al., 2017), although in another study predominately interviewing educators the emphasis was on care giving and not shaping lifelong health behaviours (Sisson, Smith, & Cheney, 2017). Unique to this study were directors' commitment to the sectors' guiding principles and ethos, articulated in the EYLF and operationalised as standards in the NQS and the positioning of nutrition within this. Universal to directors in my study was respect for children's rights to healthy food but also to choice, the development of independent skills, responsive feeding practices and the right to refuse food without being pressured to eat. These beliefs were consistent with the core values of the ELYF to foster children's agency. They also aligned with the NQS that '*Each child's agency is promoted, enabling them to make choices and decisions that influence events and their world*' (NQS 1.2.3, Quality Area 1: Child directed learning) and '*Each child is supported to regulate their own behaviour*' (NQS 5.2.2. Quality Area 5: Relationships with children). Inexplicably, despite directors' commitment to the rights of the child, familiarity with Article 24 of the *UN Convention of the Rights of the Child* was absent, as was any mention of the *Supporting young children's rights: statement of intent 2015-2018* (AHRC & ECA 2015), affirming directors' general application of children's rights rather than within the context of health.

##### *Beliefs drive nutrition-related decisions*

Findings from the present study concur with other studies that beliefs significantly affect nutrition-related decisions (Hirsch et al., 2016; Otten et al., 2017; Sisson et al., 2017; Swindle, Patterson, & Boden, 2017). A Canadian study concluded that educators' beliefs affected food practices in centre-based childcare following evidence that increasing providers' knowledge did not result in positive changes in food practices (Lanigan, 2012). Subsequent surveys at baseline and a year later, post-intervention, confirmed behaviour change where the multi-strategy nutrition program targeted beliefs. However, the effect was not statistically significant (Lanigan, 2012). The exception was a reduction in

misconceptions (beliefs) about child feeding which was associated with improved feeding practices. As a result of this study, Lanigan and others (2012) proposed that successful training needs to include evidence-based information in parallel with an exploration of common practices that are driven by beliefs, particularly those beliefs that do not support healthful eating (e.g. withholding food and using food as an incentive). The importance of directing attention on influencers' beliefs is further reinforced by the findings in a Texas study where educators' experience as children with mealtimes strongly influenced their beliefs, which in turn influenced current nutrition practices (Swindle et al., 2017). Rules and routines in childhood were found to align with beliefs and practices enacted in centres, e.g. eating together or eat first play later. These childhood experiences motivated educators to either replicate their past food legacy or establish a different legacy, pressuring children to eat and avoid food insecurity. The findings from my study suggest that the sectors' EYLF and NQS shape directors' beliefs, which in turn are translated into rules and routines passed onto cooks and educators to put into practice. The importance of understanding the influence of beliefs on nutrition practices and motivations is key, particularly where two or more beliefs are contradictory or where beliefs do not align with best practice.

#### *Dissonance between beliefs and practice*

In this present study, nutrition-related decisions were driven by beliefs and an ideological commitment to support healthy eating in children as a duty of care, a right to healthy food, and as a right for children to develop into successful, capable and competent persons (EYLF, 2009). For the most part, these beliefs aligned with nutrition best practice and supported positive child outcomes. Occasionally, however, where the directors' duty of care to provide healthy food intersected with their ideological commitment to promote children's agency, or to respect parental practices, this resulted in some dissonance. On the one hand, evidence-based nutrition best practice contends that it is imperative that children be exposed to a balance and variety of foods to develop healthy, lifelong food habits (Scaglioni et al., 2018; NHMRC, 2013), which directors viewed as their duty of care. On the other hand, the NQS asserts that children need opportunities to: develop agency by exerting choice (e.g. deciding what foods they want to eat and how much, deciding when they want to eat); become independent (e.g. self-serve); to self-regulate their behaviours (e.g. self-regulate their appetite); and to be empowered to make decisions (e.g. refuse food). Where these

two beliefs intersected, a conundrum was created for some directors, especially where practices conflicted with these beliefs.

Findings demonstrated that, left unchallenged, some best practices that facilitated children's development as independent competent people, were at odds with creating the conditions for the development of healthy eating habits. Examples of routines that were at odds and challenged centre staff were the practices of: serving meals as separated ingredients so children can make choices; self-serve, which resulted in some children preferencing one ingredient (usually white pasta or rice) and other children mirroring food pickiness. Similarly, strategies to enable children to make choices and self-regulate their food intake such as progressive mealtimes required skilled monitoring to ensure children were not precluded from socialising around the mealtime table, although progressive mealtimes were usually limited to morning and afternoon tea. Role modelling, associative learning, food conversations and intentional teaching at the mealtime table are all evidence-based practices that support positive nutrition outcomes for children (Ward, Bélanger, Donovan, & Carrier, 2015; Ward, Bélanger, Donovan, & Carrier, 2016).

#### **5.4.3 Institutional philosophy and policies driving nutrition-related practices**

Unique to this study, directors' beliefs aligned with institutional philosophies and early childhood frameworks. Beliefs were not shaped by personal experiences, such as childhood experiences (Hirsch et al., 2016; Swindle et al., 2017) and were not personal beliefs, developed without reference to the evidence, as reported in other studies (Cole et al., 2017; Lynch & Batal, 2011; Sisson et al., 2017; Swindle et al., 2017). Guided by the NQF, including the EYLF and NQS, directors were confident in these directional documents and in their local healthy eating policy, while acknowledging the challenge of unifying the broader intent of these edicts with a duty of care to provide healthy food and the conditions for healthy eating. This attitude contrasts with other studies where healthy eating policies dictated nutrition-related practices. Notably, these nutrition policies were not valued (Cole et al., 2017; Hirsch et al., 2016; Lynch & Batal, 2011; Ray et al., 2016). In some states in the USA, healthy eating policies and government resources were known, but viewed as not meeting

the needs of childcare staff who defaulted to using 'common sense' (Lynch & Batal, 2011). Also, in the USA, most centres in Puget Sound, Washington State (Hirsch et al., 2016) had healthy eating policies but perceived that their autonomy was constrained by larger corporative organisations which set the policies and curriculum. Similarly, in Finland, food policies at the European Union, state and the municipal level did not align, and children's access to a range of healthy food were constrained despite all food being provided from a central municipal location (Ray et al., 2016). Although the findings in my study found directors united in their beliefs, which were shaped by the sector's ethos and directional documents, the policies were not without some issues.

#### *Policy not explicit*

According to Dev and others (2016), explicit healthy eating policies facilitate communication with those who enact it and policy has the broadest effect by guiding food availability, food provision, and the nutrition environment (Larson et al., 2011; Seward et al., 2017). In Australia, one sentence in the NQS (an element of a standard) guides food provision and nutrition practices (ACECQA, 2018). Implementation of this succinct element relies on childcare personnel being able to interpret this with limited guidance. Directors and cooks in my study do not use the government resources available to support this standard. Notably, in this study undertaken as part of this thesis, local healthy eating policies which mainly address food provision and menu-planning were used. Childcare providers were relying on other means to make sense of Standard 2.1.3. pertaining to providing 'adequate, nutritious food' (ACECQA 2018). Ambiguity in policies is not well received by ECEC personnel (van de Kolk et al., 2018), and in this present study, the policy actions were too broad to easily implement. Moreover, reconciling the nutrition-related standard with the other standards and ethos of the NQF was challenging, and this, and the implementation of the standard pertaining to nutrition required directors' to rely on skilled staff with prerequisite professional development.

#### *Absence of professional development and training*

Directors' acknowledged that they have a duty of care to support healthy eating, yet those directors vested with ensuring this outcome in children were not supported themselves with

professional development and could not support cooks and educators with professional learning opportunities. Directors relied on highly skilled cooks and educators and spoke of their frustration with the lack of accessible and affordable nutrition-related training and professional development for ECEC staff. Cooks were drawing upon residual tools and program frameworks from the past and new cooks were starting with experience from sectors very different to early care and education and without qualifications. A preference was made for chefs with technical skills to manage large numbers of children and professional development that was a blend of online and face-to-face. Computer literacy was acknowledged as a constraint and face to face as an enabler as cooks appreciated the support from other cooks. Peer support has been shown to be effective in reaching those that are hard to reach to encourage healthy behaviours, such as healthy diets (Sokol & Fischer 2016), but there is an absence of examples in the literature for cooks or for staff working in early care and education. In the literature, the failure of the translation of nutrition best practice into daily routines has been attributed to a lack of training (Gerritsen 2016; Sigman-Grant et al., 2011). Many factors, including cross setting differences between the home and centres, is intensifying the need for professional development to support skilled cooks and educators.

#### **5.4.4 Reconciling cross-setting differences**

##### *Commitment to working with parents*

Consistent with other studies, the findings from this study demonstrated that interactions with parents were considered indispensable (Cole et al., 2017; Hirsch et al., 2016; Lyn et al., 2014; Lynch & Batal, 2011; Otten et al., 2017; Sisson et al., 2017; van de Kolk et al., 2018). The importance of parental engagement for obesity prevention is also stated in findings from systematic reviews examining interventions in centre-based childcare (Hesketh & Campbell, 2010; Mikkelsen et al., 2014; Morris et al., 2014; Nixon et al., 2012; Ling et al., 2016; Sisson et al., 2016; Ward, Welker et al., 2016). A commitment to working with parents as partners, developing supportive relationships with families and respecting families' culture, values and beliefs motivated directors, reflecting a core value of the EYLF. Supporting and respecting parents aligns with a provision in the UNCRC (art. 5) and Quality Area 6 in the NQS for 'collaborative partnerships with families and communities' (ACECQA,

2018). In the present study, directors saw their role as building a relationship of trust with parents. This open communication enabled productive conversations with parents to address nutrition concerns and identified synergies between nutrition practices at home with those in the centre. In contrast, cooks, interviewed in the previous study reported in this chapter, did not interact with parents and felt conflicted about parent's support for healthy eating in their child. This view held by cooks was shared by directors and educators in other studies. A disconnect was perceived between parents' declared interest in promoting healthy eating and actual application (Cole et al., 2017; Hirsch et al., 2016; Lyn et al., 2014; Lynch & Batal, 2011; Otten et al., 2017; Sisson et al., 2017; van de Kolk et al., 2018).

#### *Discrepancies between the home and centre environments*

The inconsistency between foods offered in some homes and those provided at childcare was perceived as problematic by directors in this study and in most other studies (Cole et al., 2017; Hirsch et al., 2016; Lynch & Batal, 2011; Sisson et al., 2017). Kolk et al., (2018) reported environmental barriers at home significantly impacting cross-setting differences between the home and the centre. Moreover, in one study, parents were perceived as expecting centres to do the difficult tasks (such as encouraging children to eat vegetables) not expected at home (Sisson et al., 2017), thereby adding to the disparities between the two settings. Discrepancies between both settings have shown negative effects on children's dietary outcomes, with significant differences between the home and centre setting found for 13 out of 15 diet-related practices with childcare scores more favourable than scores from parents (Gubbels et al., 2018). Socio-ecological perspectives hypothesise that the more interactions between two or more micro-systems are linked, the more likely health outcomes will be positive (Gubbels, Van Kann, de Vries, Thijs, & Kremers, 2014). The widening discordance between food practices and provision at home with those in the centre creates further dissonance between enacting a duty of care for healthy food and supporting parental practices, as defined by the NQF. Strengthening interactions between the two micro-environments could improve child health outcomes (or at least cause no harm) and some directors viewed this discrepancy as an opportunity to educate parents. Before reconciling practices between the two settings the causes of the inconsistencies would need to be explored first, which directors in this study gave some insights into.

#### 5.4.5 Cognisance of societal pressures and the impact on parents

This study revealed several societal factors according to directors which impacted working parents and thereby the provision and promotion of healthy food in centres. Changing family food preferences accounted for some of the discrepancies between foods offered at centres and those offered at home. Increasing requests for cultural, religious or other family food preferences such as gluten-free foods reflects changing contemporary food trends also experienced in centres in the USA (Hirsch et al., 2016) and other Australian states (Cole et al., 2017). Furthermore, Hirsch et al., (2016) suggests that changing food trends reflects a change in families understanding of what healthy eating is. Adding to this complexity, requests to cater for an increasing number of allergies has also been described (Cole et al., 2017; Hirsch et al., 2016; Otten et al., 2017), adding pressure to centres for a flexible, responsive menu that is still health promoting.

Families in general are under intense pressure from the challenges of a modern world, with busy parents struggling to achieve a work-life balance, find time to shop and spend time together over meals (Bauer, Hearst, Escoto, Berge & Neumark-Sztainer, 2012; Bekelman et al., 2018; Jastreboff, Chaplin, Finnie, Savoye & Stults-Kolehmainen, 2018; Mehta, Booth, Coveney & Strazdins, 2019; Storfer-Isser & Musher-Eizenman, 2013). These pressures, resulting in parental stress and time-scarcity, impact on the types of food provided at home, thereby increasing further the disparities between the two settings. Parental stress is associated with poorer food choices (Bauer, Hearst, Escoto, Berge & Neumark-Sztainer, 2012; Jastreboff, Chaplin, Finnie, Savoye & Stults-Kolehmainen, 2018) and time-scarcity is associated with more convenience and highly processed foods (Bekelman et al., 2018; Mehta, Booth, Coveney & Strazdins, 2019; Storfer-Isser & Musher-Eizenman, 2013). Compounding cross-setting differences further, food insecurity is a phenomenon increasingly experienced by some families. Limited access and affordability to healthy foods has been attributed to the differences in foods offered in centres and in homes in several countries (van de Kolk et al., 2018). Food insecurity impacts up to 56% of families using *Head Start* childcare centres in the USA (Swindle et al., 2017), and in Australia is a determinant affecting many families in the general population (Gallegos et al., 2016; Foodbank 2018). When considering what affects the enactment of nutrition best practices,

societal factors need to be considered, such as changing trends in family food preferences and the differences between the home food-environment and the centre food-environment as a result of parental time-scarcity and food insecurity.

## 5.5. Conclusion

In summary, this study provides new insights into factors which influence nutrition-related decisions in centre-based childcare and constrains or enables the translation of nutrition best practice into daily routines. It is vital to recognise that directors are central to this translation as directors determine the centre's nutrition-related strategies and cooks and educators operationalise them. By actively engaging and interacting with cooks, educators and parents daily, directors influence the centre's food, social and information environments. Profoundly shaping these nutrition-related decisions and actions were directors' beliefs including a sense of mission to foster healthy eating habits in children and a commitment to the sectors' guiding principles and ethos articulated in the EYLF and operationalised as standards in the NQS. Directors acknowledged their role in being influential and attributed meeting children's needs for optimal nutrition successfully to having a skilled cook and educators. As such, decision-making reflected strong relationships with parents, cooks and educators and a complex number of interplaying factors within and between several levels of influence.

Making decisions and strategizing, involves navigating between the demands and considerations of many different influencers and influences, some of which can be competing. The intersection between the provision of healthy food as a duty of care and the fulfilment of the NQS to support parents' contrary to expectations or practices caused some inner conflict to directors. Usually providing best nutrition practice aligned with providing best practice according to the NQS but widening food-related inconsistencies between the centre and home settings, is exacerbating this discordance. Changing family food preferences in response to contemporary food trends and societal pressures resulting in parental time-scarcity, parental stress and food insecurity were attributed by directors to



impacting the home food-environment and increasing the disparities between the centre and home setting.

Aware of these influencing factors, directors deferred to educators' and cook expertise to manage these complexities and delivery nutrition best practices. However, the staff in which operationalising nutrition was vested were unsupported with professional development and training. Although directors acknowledged the challenges faced by cooks and educators, timely training and professional development was not affordable, available, or accessible. This vulnerability suggests that the positive nutrition practices implemented in childcare are more by goodwill rather than by design.

### *Implications*

Vital to supporting nutrition best practice is the involvement of directors. Directors are central to the translation of nutrition and the NQs into strategies which cooks, and educators implement. The centrality of the directors' role affirms that it is not necessary to interview educators to answer the research question as directors' direct what educators do. To create the conditions needed for optimal nutrition to be promoted and provided to children, directors rely on the skills of cooks and educators, but professional development and training in nutrition is missing. There is an urgency to find workable solutions for the provision of timely and appropriate professional development, which is affordable, available and accessible. To be most effective, professional development needs to examine childcare providers personal beliefs, otherwise their knowledge will stay the same, and routines contrary to nutrition best practice prevail. Moreover, professional development needs to include an understanding of how nutrition is positioned within the NQS, how it aligns with the sectors underlying principles and ethos and how the potential dissonance, where two contrary beliefs intersect, is reconciled.

Furthermore, societal factors which impact the widening differences between the home and the centre setting warrants further investigation. Changing family food preferences, changing contemporary food trends, evolving parental definitions of healthy eating and parental stress due to time scarcity and food insecurity, all impact the centres' capacity to promote and provide optimal nutrition. To answer the research questions, however, it is

necessary to understand directional frameworks and guidelines from the policymaker and policy-enforcer perspectives. By understanding these interactions, the barriers and facilitators can be explored further, and opportunities for strengthening children's nutrition further identified.

## **Study 3: Factors Influencing Nutrition-related Decisions in Centre-based Childcare: Decision-makers' Perspective**

### **Preface**

The aim of this study was to examine decision-makers perception of the factors which enable or constrain the promotion and provision of healthy nutrition in centre-based childcare, plus their insights into the evidence-to-practice gap. Influential decision-makers were deemed to be people who contributed to the formation of policies that influence centre-level practices. Research findings from the two previous studies with cooks and directors were shared with the decision-makers during the interview as part of the process of examining their perceptions and insights. These findings included several identified factors which facilitated and constrained the capacity of cooks and directors to translate evidence-based nutrition practices into day-to-day routines. Notably, central to cooks and educators enacting their duties were directors, who were responsible for the daily management of the services and the delivery of quality services to the children and families. Directors actively engaged with educators, cooks and parents, influencing several centre micro-environments including the food environment, the social environment, and the information environment (including intentional teaching activities). As such, directors determined the nutrition strategies to be implemented within a centre and cooks and educators operationalised it. Significantly influencing directors were ECEC directional documents and policies. Given that it is influential decision-makers who make and enforce policy across the state or nationally, the experiences and perceptions of policymakers and policy-enforcers warranted further investigation as part of this thesis. This is the third of three empirical studies interviewing key childcare personnel and, to the best of my knowledge, key decision-makers have not been interviewed before.

---

### **5.1. Introduction**

To gain a fuller understanding of how evidence-based nutrition guidelines and practices are translated into daily routines in childcare services, the perceptions and views of decision-makers (DMs) who work in influential positions were sought. Decision-makers are influential

because of their role with policies that shape centre-level practices. Four types of organisations employ DMs with this scope of influence: state government authorities responsible for assessing, rating and regulating early childhood services against *the National Quality Standards (NQS)*, *National Quality Framework (NQF)* and relevant laws; state government departments responsible for formulating and implementing public health nutrition policy; an independent national authority with the mandate to oversee the ECEC system and improve outcomes for children and families; and non-government organisations with the state-wide directive to build ECEC capacity for innovative and responsive services.

Several studies have explored care-providers experiences, but to the authors' knowledge, very few studies, if any, have sought DMs views. This understanding is essential as DMs create the policy and thereby the environments that ECEC services work with to promote and provide healthy nutrition. This understanding of DMs' experiences and perceptions helps make sense of complex nutrition-related practices by highlighting factors which act as barriers or enablers. Moreover, this understanding explains the factors that shape operational decisions, as well as interactions between different levels of influence described in the previous studies as part of this thesis. This understanding can strengthen the implementation of effective, healthy eating guidelines and nutrition practices, which will improve children's nutrition-related health. The purpose of this study therefore was to examine decision-makers (1) perception of the enablers and barriers identified by cooks and directors to promote and provide healthy nutrition and (2) their insights into factors which support nutrition-related decisions.

#### *Brief recap of findings from cook and director studies*

In keeping with the grounded theory approach, findings from the studies with cooks and directors were relayed to the DMs as part of the interview. As a brief recap, cooks' decisions were shaped by their perceived role and commitment to providing healthy food within the centre, their belief that their input would influence children's health behaviours, and their understanding of healthy eating accumulated after years of work experience in the same centre, augmented with professional development and resources from experts. At the centre-level, children's food preferences were the most influential factor and cooks' efficacy to provide food was bolstered by centre-based healthy eating policies, which they were able to translate into day-to-day menu-planning and practices. According to cooks, increasing

numbers of special diets attributed to escalating allergies and food intolerances and changing family food preferences were threatening their efficacy. Also, threatening cooks' efficacy was an absence of accessible, affordable and available professional development and an absence of expert support to address the increasing complexity of their role. Food provision was the main remit of cooks, whereas directors were central to all nutrition-related decision-making within and between several levels of influence. Directors actively engaged with educators, cooks and parents on a daily basis, influencing several micro-environments within the centre including the food environment (food provision and menus), the social environment (mealtimes), and the information environment (intentional teaching activities, the curriculum, nutrition education directed at children and parents). Directors demonstrated a holistic view of nutrition and identified many opportunities to support children's healthy eating habits beyond food provision and in partnership with parents. This ideological commitment held by directors reflected the *Early Years Learning Framework* (EYLF), which underpins the *National Quality Standards* (NQS) used for accreditation.

Directors, however, sometimes felt a dissonance between supporting parental practices and expectations and their duty of care to ensure healthy nutrition for children. Widening food-related inconsistencies between the centre and home settings affected some children negatively, exacerbating food pickiness and food refusal behaviours. Directors tended to defer to educators' and cooks' expertise to manage these challenges and the differences between the home and centre. Although directors recognised an absence of relevant professional development to assist providers, they struggled to find suitable training and support. Findings highlighted: the influence of a changing food culture and changing food-related parental practices; the role of the policy environment; the intersection between providing healthy food, quality care and education; respecting family values and responsibilities; and upholding children's rights for agency, choice and growing independence. Given the influence of policy on directors' motivations and practices DMs, who were policy makers or enforcers, were interviewed using the method described in the next section.

## 5.2. Method

Using qualitative methodology, decision-makers' perceptions and responses to the enablers and barriers described by cooks and directors were obtained through semi-structured one-on-one interviews. The initial enablers and barriers presented to the DMs were those identified by cooks and directors influencing the provision and promotion of healthy nutrition in centre-based childcare services.

### 5.2.1 Participants

People in leadership roles that influence the provision and promotion of nutrition in ECEC services were approached to participate in the study. Potential participants were identified from listing the organisations with a mandate to support ECEC services and recommendations from people within a growing ECEC network around this work. One decision-maker was referred to the study as a condition of receiving ethics approval from the Department of Education and Children's Development (DECD). Another decision-maker was recommended by one of the DMs who was interviewed as someone who would be valuable to the study.

An email describing the study was distributed to the identified DMs. Upon granting their permission for participation in the study, a phone interview was arranged at a time convenient to the DM. DMs were reassured that participation in the study was voluntary, that their organisation and identity would be kept confidential, and their views were considered to be their perceptions. Anonymity and confidentiality were assured in all parts of the study, including reporting, but with a caveat. DMs were aware that anonymity could not be guaranteed as their positions were unique and people working within the ECEC sector could recognise comments as aligning with a particular organisation or recognise who they were.

### 5.2.2 Data collection

An interview schedule with semi-structured questions was used to gather rich, descriptive data. As with the other qualitative studies, the questions were open-ended to allow participants to provide their opinions and insights. The initial question asked participants to

describe their role and how their position influenced nutrition-related decisions in ECEC. Subsequent questions asked DMs to describe the enablers and barriers that influence the provision and promotion of healthy nutrition in ECEC services. These questions were very similar to those asked of cooks and directors in the previous two studies in this thesis. Following these responses, the summarised findings from the cooks' study were read to the DMs and their response to the identified enablers and barriers sought. A similar process was then followed using the summarised findings from the directors' study. The last two questions asked DMs for their opinion about the rights of a child for healthy nutrition (Article 24 of the UNCRC). DMs were also asked for solutions for strengthening the provision and promotion of healthy nutrition in centre-based services. The interview schedule contained prompts that were used to probe the participants for more detailed responses if necessary. The summarised findings from the cooks' and directors' study was documented in dot points and read to the DMs.

The interview schedule and script of the summarised findings with cooks and directors was pilot tested with a DM and the data included in this study. Changes were made to the presented summary of the cooks' and directors' studies, so they flowed more logically and were separated to assist the participant with responding. The question asking DMs for their definition of healthy eating was deleted because it provided the same answer as described by cooks and directors. This study was informed by grounded theory and, consistent with this approach, some of the prompts were modified to include comments from previous interviews. Each interview potentially influenced the questions of subsequent interviews. Changes to the interview schedule, as a result, included an additional question asking who was responsible for providing professional development.

Interviews lasted about an hour and were audio-recorded with participants' approval. Participants were aware that they could request that the conversation not be recorded at any time during the interview.

### **5.2.3 Analysis**

Interviews were transcribed verbatim from the audio recordings. The transcripts were checked for accuracy and read multiple times before being coded. In keeping with grounded

theory, each interview was coded before undertaking the next interview so that information from the interview could be used in the subsequent interview if appropriate (Creswell & Poh 2017). Interviewer reflections were recorded after every interview and continuously referred to after subsequent interviews. Also, an audit trail was kept of changes to the process.

After becoming familiar with the transcripts, the data was initially coded as described by Hsieh and Shannon (2005), using NVivo v.11 and followed the process for thematic analysis as described by Braun and Clarke (2006). Data which contained similar phrases were grouped under a code. Codes were then categorized with categories loosely developed around the Ecological Model for Health Behaviours described by Sallis and colleagues (2008). Using the Ecological Model enabled the coded data to be themed into levels of influence. Notably, not all of the data related to a level of influence. However, the data was also coded and considered for thematic analysis.

Each category of coded data was scrutinized for themes, emerging themes and sub-themes. Data within and between themes was also continuously examined. Grounded theory allows for concepts from the DMs to emerge from the interview data, both from individual questions and across the whole interview. Care was taken to allow the themes to emerge from the participants' responses to ensure the themes were 'grounded' in the responses and explanations of the participants (Creswell & Poh, 2017). Sub-themes emerged to explain some themes further. After the identification of the themes, representative quotes were selected. The transcripts were reviewed once more for additional supporting or discordant evidence (Creswell & Poh 2017).

## **5.3. Results**

### **5.3.1 Respondents**

Seven decision-makers were interviewed with five DMs having leadership roles in SA and two with leadership positions nationally (in ACECQA, based interstate). The range of organisations and the organisation's role is depicted in the following text box.



### **Range of organisations and the organisation's role**

- A non-government organisation with the state-wide mandate to lead the development of innovative and responsive ECEC services for children and families and to build the leadership capacity of ECEC providers and educators
- A state government authority responsible for regulating early childhood services, providing approvals for services to operate, assessing and rating services against the NQS, educating services about compliance with the law and NQS, taking action when the laws are breached and supporting services to reach the minimum 'meeting' NQS standards
- An independent national authority jointly funded by the Australian Government and state and territory governments to oversee the ECEC system and assist state and territory governments to administer the National Quality Framework (NQF), apply National Education and Care Services Law and to improve outcomes for children and families
- A state government body responsible for determining the policy framework and strategic directions for the delivery of public health services and monitoring the performance of South Australia's health system.

The range of positions interviewed included leadership responsibilities;

- with the state-wide remit to develop responsive and innovative services to support children and families, provide professional development to ECEC educators, and support the implementation of the NQS
- to build the capacity of ECEC childcare providers to offer inclusive practice for children with a range of abilities within mainstream services
- to assess and rate ECEC services according to the NQS, legislation and regulations.
- to over-see the accreditation of ECEC services across Australia

Interviews took typically 55 minutes (53-62 minutes), and the following results are summarised under the identified themes and sub-themes.

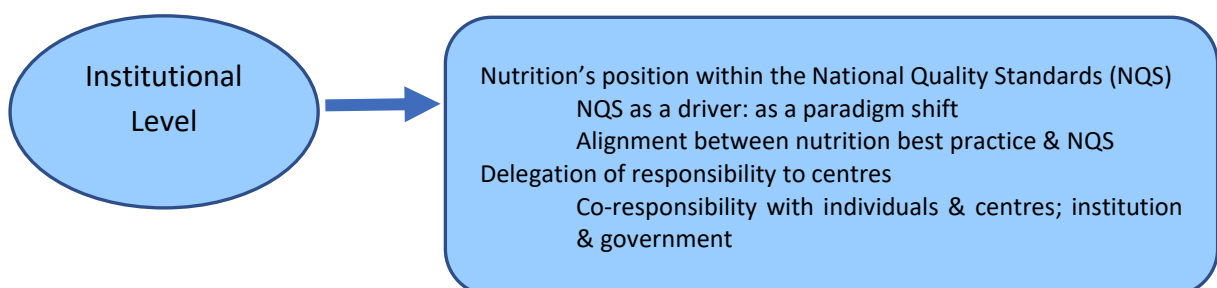
### 5.3.2 Findings

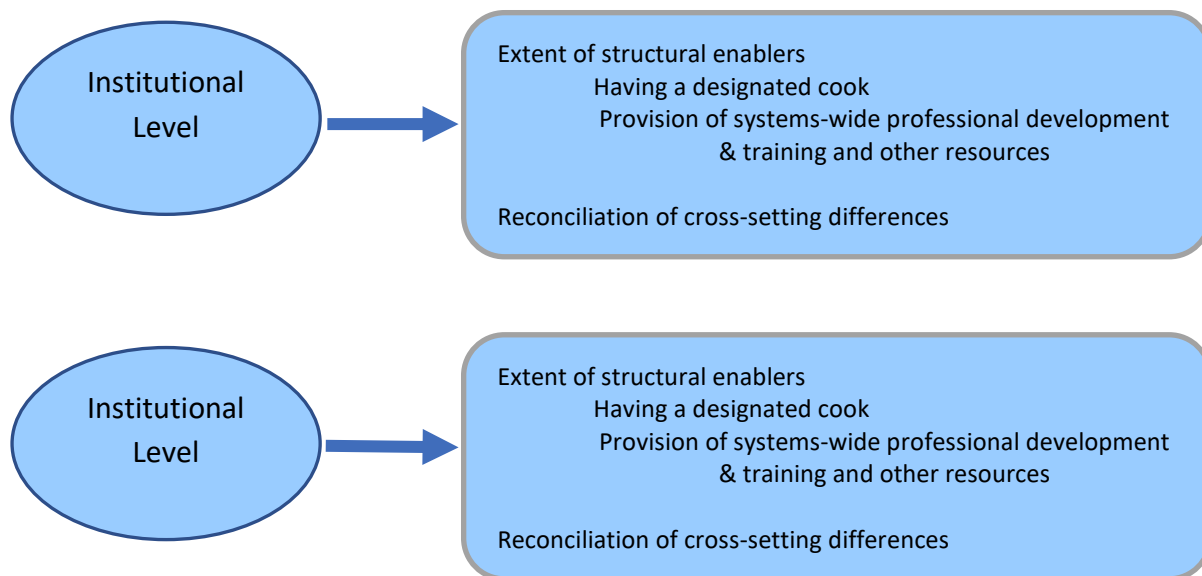
Themes were organised under three levels of influence which were derived using the Ecological Model of Health Behaviour (Sallis et al., 2008); institutional-level of influence (nutrition's position within the NQS), centre-level of influence (designated cook, structural enablers, cross-setting differences); and individual-level of influence (professional learning, beliefs and values). Some of these themes included sub-themes as depicted in

Figure 5-3 (Themes (and sub-themes) from a thematic analysis of semi-structured interviews from influential ECEC decision-makers). Nutrition's position within the NQS, for example, included three sub-themes: NQS as a driver; NQS as a paradigm shift; and alignment of nutrition practices with NQS. Underpinning these themes was the issue of responsibility and children's rights. The results from the thematic analysis are described as follows.

#### Levels of Influence

#### Themes and sub-themes





**Figure 5-3:** Themes (and sub-themes) from a thematic analysis of semi-structured interviews with influential Early Childhood Education and Care (ECEC) decision-makers

### 5.3.2.1 Institutional level: Nutrition’s position within the NQS (theme)

Decision-makers were unanimous that the NQS was the most significant driver for supporting the provision and promotion of healthy nutrition. According to DMs, although the NQS has resulted in many positive outcomes, they agreed with the cooks and the directors that some challenges exist with implementing the NQS element and standard for healthy eating. These challenges related to an understanding of how nutrition is positioned within the NQS including the interpretation of the NQS and the alignment of recommended nutrition practices across all seven quality areas.

#### ***NQS as a driver (sub-theme)***

According to DMs, the NQS has ‘undoubtedly’ been a driver for best practice nutrition with the capacity to ‘be really good’. Since the NQS was introduced as part of the NQF, centres have aimed to meet the nutrition-related standard (Standard 2.1 Element 2.1.3) by employing a cook and putting various systems in place to support the provision and promotion of nutrition. When the findings from the cooks’ and directors’ studies were shared, one DM commented that, *‘Look, undoubtedly, the motivating factor there would be the National Quality Standards whereby they had to be able to demonstrate that they’ve got*

systems in place and that they're aware of those issues' (DM1). With regards to cooks, one DM reiterated:

*'I think that I have seen quite a significant increase in their knowledge and passion for what they do as well, and willingness to come out to professional learning, whereas in the past, they weren't seen as much.... And I think that what's influenced that is the National Quality Standard' (DM2).*

Some DMs explained that the NQS 'elevates' food and nutrition as a focus in centres '*because food is a big part of children's life*' (DM2). The NQS also has a strong emphasis on engaging with families, and '*when you involve the family, food always comes into it*' (DM2). This comment from a DM who supports centres to understand and enact the NQS stated, '*we're talking obviously about food the minute that they walk through that door*' (DM4). According to DMs, nutrition was prominent in the centre and in children's and families' lives.

As well as being a positive driver for supporting the promotion and provision of food and drinks, the NQS ensured compliance through, '*the spectre of assessment and being rated*' (DM1) with childcare providers fearful of making errors. The drive to avoid errors was illustrated in this comment by a DM sympathising with the pressure's cooks spoke of when providing additional meals:

*'And the regulatory authority is pretty unyielding too where there're errors, where mistakes are made and I'm not talking about anaphylaxis, where there're food preferences or food intolerances and that kind of thing. You get it wrong and someone complains and you get it'* (DM1).

### ***NQS as a paradigm shift (sub-theme)***

Since the NQS was introduced in 2012, the influence of the NQS was considered significant by DMs, '*So there's a huge change in the way we practice and the way we see the everyday things that we do*' (DM2). DMs concurred that the NQS drives continuous improvement and supports centres to view the child holistically. This holistic view includes food and nutrition, with food threaded through all seven NQS quality areas, '*this includes a child's food and culture. Food is not only about meeting children's nutritional developmental needs. Food is part of a whole approach with children*' (DM2). This sentiment was common among DMs, 'I

*think it's about this more holistic view of the child and of food beyond that you need to be getting x serves of vegetable or whatever' (DM5). 'I think it also needs to be more than nutrition. It's about the whole child and as a person in terms of well-being and positive mealtimes and all those sorts of things' (DM7).* A holistic approach was seen with nutrition practices connecting across all seven quality areas of the NQS, such as food refusal presenting opportunities for intentional teaching, conversations with the child, discussions with the family and professional learning.

### ***NQS alignment with nutrition best practice (sub-theme)***

Not every DM agreed that nutrition aligned with the NQS. One DM stated how a 'deficit' and negative approach was used with nutrition:

*'I think we're still in that space around nutrition and eating – we think of it in deficit model – what aren't they eating, what aren't they doing, what's – that kind of thing. So, we're not seeing children as capable and confident eaters' (DM7).*

The DM continued that good nutrition practice is approached as providing food for the children and not giving children agency and the opportunities to develop:

*'we don't look at nutrition as being part of the whole child and we tend to try and look at children as capable and competent but not when it comes to nutrition. We don't give them the credit that if we give them the right tools, they could be very capable and competent' (DM7).*

An analogy was provided about how centre staff do not give children a completed puzzle to play with but the parts, so children can learn new skills. According to some DMs the shift in paradigm to view children holistically as a result of the NQS was difficult if individuals did not have a deep understanding of the philosophy and values underpinning the NQS. Since the NQS was initially introduced, this understanding has developed:

*'at the beginning, it was very – probably want of a better word – not shallow, but just going with whatever, we thought it meant, whereas, over the years, we were able to reflect on things a little bit more deeply. There's a lot more information out there and there's a lot more support from, I guess, the way people are doing things' (DM2).*

Although gains have been made in understanding the NQS, some DMs acknowledged that understanding the element related to good nutrition (NQS 2.1.3), was still developing for some childcare providers and the approach for continuous improvement without prescriptive guidelines, *'opens the door for misinterpretation'* (DM2), as further explained:

*'I think it can be challenging for a lot of people, particularly if they don't have a really good understanding or deep understanding of the standard, which is quite ambiguous.'* (DM2).

Misunderstanding the NQS was attributed by some DMs to a lack of 'deep' and critical reflection and a lack of leadership guidance, as described by one DM whose role was to *'defuse myths and misinterpretations'* around the NQS:

*'so, it really comes down to really having good leadership in place and educators that are reflective about what they're doing and passionate about what they do. So, I think it can be misunderstood and just misinterpreted if it doesn't have the right guidance, if that makes sense. So, it is a little bit hard to follow if you don't have a really good or deep understanding of it'* (DM2).

When the findings from the cooks' and directors' studies were shared with DMs, DMs were empathetic to the challenge of increased menu complexity because of allergies and changing parental expectations. DMs believed that services had developed systems to deal with managing potential risks, albeit they were dependent on childcare personnel's skills as described by this DM:

*'I mean in terms of removing food, we would probably do that as a last resort, and do it on a case-by-case basis, and we would risk assess it. So we would think about what's the impact for that child and how might we be able to minimise the risk, so can we be able to have dairy when that child is sleeping, for example, what are the ways that we could work around that, so that the first option would not be just to remove it. Again, that relies on the skills of the people that are working directly with children and their reflective capacity'* (DM3)

Decision-makers were confident that the practice in a few centres to remove food groups from the menu was used as a last resort, and an interim strategy because of the effect on

other children. *'At the core is the interest of the child but also the interests of groups of children'* (DM3). Central to childcare providers managing these situations was their ability to use critical reflection, supported with professional development and an ability to interpret the NQS as intended.

DMs acknowledged that there was a range of nutrition practices used in food provision that varied in the extent with which they aligned with the NQS. These ranged from providing progressive mealtimes to providing pre-portioned meals to each child from a trolley of food. Being time-poor and meals being a routine rather than children viewed as part of a whole and provided with a positive mealtime experience including nutrition-related conversations, was a constraint for cooks and educators, according to some DMs:

*'And we touched on it already that educators being particularly time-poor around mealtimes – it's more of a routine rather than a mealtime. So, it's kind of – get children there. Eat. Get done, ready to typically go and lay down and have a rest or have some kind of rest after lunch. So they don't wanna be challenged by children who don't wanna eat particular food or they have to work with or discuss with it and all that kind of thing, because they've got a routine set, that they've got 20 minutes to get everybody fed and done and washed hands, have toileted, and on their beds ready for their afternoon nap'* (DM7).

A few DMs were concerned where the NQS seemed to be misinterpreted. In this example, a DM responded to a situation with a child refusing meals and being regularly given a sandwich, with the other children mirroring this behaviour and given sandwiches too. The DM asks if adequate critical reflection had been used with this situation:

*'So, is it around, "If I give that child a sandwich, everyone else wants one?" or is it around, "Are we giving children enough choice?" Do the children have enough agency over what they eat, or do we support them in developing that sense of, "I'm full now. I don't want any more," or, "I've got the ability to make a choice whether I wanna eat this or not because I'm not gonna go hungry. It's not gonna be taken away from me," or, "I'm not hungry right now, so I don't want it." Is it that or is it the sandwich? Do you know what I mean? To me, I think they haven't thought it through deeply enough'* (DM2).

In a similar situation, a DM challenges the interpretation of some centres that separating ingredients and presenting a deconstructed meal is a misinterpretation of giving children choice:

*'And I don't think that it butts up against the National Quality Standard. I think it's their interpretation of it. It doesn't say that you have to separate all the meals. And I've heard that quite a bit from different educators saying, "Now, we can't put sauce on top of the rice." Who said that? It's just the way that they've read the standard. So, it doesn't say that you have to – somebody's come up with the idea that if you separate it, that's giving children choices' (DM2).*

### **5.3.2.2 Centre level: structural enablers and cross-setting differences (theme)**

Decision-makers identified the following as imperative enablers for healthy nutrition: having a designated position that provided the food, program frameworks and tools for menu-planning, healthy eating policy tailored to each service and financial stability to support a cook and the provision of healthy ingredients.

#### ***Designated cook (sub-theme)***

Having a designated cook who understands children's food preferences, engages with the families and educators for feedback and can develop a menu with healthy options was identified by all DMs as enabling the promotion of healthy nutrition in centres. Decision-makers elaborated on the value of having a cook, commenting that cooks are a *'big part and valuable part of the service'* (DM2), and, *'we've found that cooks can set the tone for the centre. You got to keep the cook happy'* (DM2). Affirming this view, a decision-maker commented: *'Often the chef or the cook is quite a celebrity with the children and a very popular person, and it creates a really lovely interaction for the children and families'* (DM4).

Centres which had educators rostered to provide meals, *'who don't have the time or maybe the level of understanding around nutrition'* (DM4), were not viewed favourably by DMs. DMs unanimously believed that cooks played an important role in the delivery of quality services. However, one DM stated:

*'I think that for a lot of the time when we talk about delivering quality services and quality outcomes for children, people's first thought isn't, "Oh, cooks play a part in*



*that.” But they actually do play a really important part in delivering quality outcomes for children, particularly in relation to health and safety, but as well as a whole range of other areas kind of thing when we think about the National Quality Standard that so much of it can be influenced by the cook’. (DM7)*

A distinction was made between services employing a good cook because they made good food and employing a cook because of the important role they fulfil. Unlike other staff employed according to strict staff ratios to children, one DM speculated that cooks could feel vulnerable about their job because if the menu became too difficult cooks were...

*‘aware that at any time a decision can be made that we no longer need a cook at this service, we’re gonna just get children to bring their own food, or we’ll just get a delivery service to deliver us meals every day. (DM7)*

It was easy for centres to decide *‘We’re just gonna outsource it’ (DM7)*. Lunchboxes were also identified as a barrier by some DMs because services could only advise what should be provided in lunchboxes and did not have the authority to ensure that children brought foods from home consistent with the NQS standard for nutrition. The lack of authority to ensure healthy foods are bought into the centre was described by this decision-maker about lunchbox centres:

*‘they can promote but obviously they can’t oversee what’s actually given to the children. So that’s a challenge services have to work on, that continual support for families to understand the value of what’s appropriate to be in a lunchbox and what’s not’. (DM4).*

Conversely, many DMs articulated that cooks had the potential to be integrated within the service and the community *‘beyond just – “I’m in the kitchen making food”’ (DM5)*. This was elaborated on further:

*‘I mean if you do food and nutrition well in terms of gardening projects and involving families and having the cook who’s integral to the service, there’s so many connections that can be made across lots of other quality standards in terms of engagement and collaboration and connection and really quality educational*

*programs. There's lots of really good things that can be done through food and nutrition'. (DM7)*

The value of having a designated cook was summed up in this quote from a DM:

*'I still believe that centres rise and fall depending on the cook they've got and they're usually the heart of the service. And I think we're just not – they're just undervalued to what they can contribute and when we think about our vision of children having the best start in life, you can't have a good start in life without being healthy and that kind of thing as well'. (DM7)*

### **Other structural enablers (sub-theme)**

As well as a designated cook, according to some DMs, program frameworks and tools made services accountable for providing healthy nutrition:

*'programs certainly help, so programs such as 'Start Right Eat Right' or 'Feed Australia', those sorts of programs provide a good framework of support around services and a level of accountability in terms of what's important'. (DM3)*

Also credited with enabling services to provide and promote healthy nutrition were the Australian Dietary Guidelines (NHMRC, 2013) and the centre's healthy eating policy (HEP). One decision-maker further elaborated that when centres are assessed there needs to be evidence that the HEP is current and applied,

*'Every service is required to have a policy in place. So, we would want to see in their policy reference to accurate, guiding documents and up-to-date legislation. But the key is obviously when that policy is implemented.... So sometimes the policy might be really robust and might be very detailed, but if not actually implemented in practice...'. (DM4)*

Financial management was not raised as a barrier by cooks or directors in the previous studies and was also not raised as an issue by the DMs, except for one DM. This decision-maker stated that financial sustainability could be a barrier to the provision of healthy foods to children, *'if finances don't support the purchase of good quality food'* (DM4). For example: when establishing their business, *'sometimes they wouldn't serve enough food for*

*children to have another serving, so there's limited funding allocated for the menu, if you like'. (DM4)*

### ***Reconciling cross-setting differences (sub-theme)***

When the challenge was raised of cooks experiencing foods being very different from those at home, DMs concurred with centres wanting to align the food provided with family practices:

*'I think that also I would agree with the fact that the service wants to support that engagement with families and that does include that food preferences are met, and it applies to routines and things as well. Families are becoming more informed that they can request things within their childcare and that's absolutely right. They shouldn't just accept what the childcare offers'. (DM4)*

Forming collaborative partnerships with families as stated in the NQS, Quality Area 6, prompted a DM to declare that *'the parents have a right to negotiate care plans for their children and that would include food'* (DM4). DMs agree with this view but also concede there is a duty of care to provide children with healthy nutrition:

*'I think every child that walks through our door is entitled to have 50% of their nutrition needs met, at least that much, and that they're also entitled to have a positive experience with food and nutrition, so that they can be the best they can be, if you like, they have healthy relationships for food for later in life'. (DM3)*

Two DMs reflected that the nutrition challenges as a result of the differences between the home setting and childcare services were managed more easily by educators than cooks. Educators with young families experienced these challenges first-hand with their own children and, because they worked with a group of skilled peers, had the opportunity to problem-solve and resolve challenges. Cooks in contrast were often sole positions and did not have the same opportunity for discussion:

*'Hey, we all face that same challenge.....it's a unique situation for the cooks 'cause they're the only ones they've got to talk about it, whereas educators can talk with the other educators'. (DM7)*

Most DMs attributed strong, trusting partnerships with parents as central to addressing nutrition differences between the home and the centre setting where the expectations, philosophy of approach and nutrition-related practices are known very early. This sentiment was encapsulated by one DM:

*'I think part of it is around clear expectations right from the word go .. – what's the philosophy for service in relation to food, is it something that families start at your service knowing that this is what the expectation is, that this is the approach that we take. We go down this path and we have healthy eating and we don't vary from that, regardless if you come and tell us that your child can only eat nuggets and that's all they'll eat and that you demand that that's what happens, then maybe this isn't the service for you, and that kind of thing....But having a space where there can be that open dialogue so parents trust the service and services honour that trust by being open with them around what's happening and what the expectations are and that kind of thing'. (DM7)*

All DMs acknowledged that, as well as families, all childcare personnel needed a clear understanding of expectations: *'what makes it easier is when staff are fully across it as well'. (DM7)*

### **5.3.2.3 Individual-level (provision and support for professional learning, staff beliefs and values)**

In response to hearing the findings from the cooks' and directors' studies, all of the DMs acknowledged the difficulties accessing appropriate nutrition-related professional development and how professional learning was crucial for ECEC staff. Enablers and constraints impacting the provision and support for professional learning included factors at the individual, centre, sector and wider levels according to DMs.

#### ***Provision of professional learning (sub-theme)***

Most DMs identified a lack of nutrition-related training, nutrition expert advice and professional learning resources as a barrier, with several commenting that centres' *'just rely*

on whatever they can find', 'have no particular place to go', there are 'no guidelines'. A decision-maker who provided professional development regularly stated that:

*'Since Start Right Eat Right fell through, I think that services are just relying on whatever they can get their hands on, on councils or whatever is available online, and things like that'. (DM2)*

Complicating the situation, the resources and programs available were constantly changing, with DMs commenting that childcare staff were not sure who to listen to, where to go, or who was giving them the right information. The uncertainty and constant turnover of different programs and resources relating to nutrition resulted in frustration as relayed by this DM:

*'So, every time there's a new initiative, they change direction without thinking, "Actually, is this initiative better than the last one and should we be listening to this or should we be doing this?" Or someone says, "Oh, there's a new thing out, we've got to do this now." And so, often they do get caught up in not knowing what's the right thing to do, so they just throw their hands up and just go, "Oh, we'll just do what we always did," but it's not always the best thing'. (DM7)*

DMs with experience in working with centres across the state and nationally commented that some of the more extensive enterprises provided in-house professional learning but for most centres access to nutrition-related training and nutrition expert support varied widely: *'I think there would be a lot of variety in that in terms of whether it's happening or not'. (DM3)*

Similarly, cooks entering employment without access to nutrition training, and relying on previous work experience in aged care, or as a chef in the hospitality industry, was raised as a concern by DMs. This prompted DMs to comment on the required qualifications of ECEC cooks where the job description usually only specifies a qualification in food safety. It was suggested that cooks should have as a minimum *Certificate 111 Early Childhood Education and Care* which includes child development and food and drink provision; however, this was not a universal view shared by all DMs. Some DMs believed they were not in a position to comment on cooks' qualifications but acknowledged that *'I guess it can be traced right back to their professional experiences and their professional qualifications when they achieve*

them. *The trainee is only as good as the trainer*' (DM4). Some DMs reflected that the ECEC sector was a low qualified profession in general and *'not much'* was taught related to nutrition in the qualification.

Some DMs raised the issue of currency, i.e. up to date nutrition knowledge and knowledge of the changes in evidence-based guidelines (such as those for allergies), raising concerns that cooks were relying on past experience:

*'So if they're relying on that initial training, obviously there's going to be varying levels of quality of those qualifications and if they're relying on that and their current experience, then that's a risk really unless the director is really on top of making sure they're getting new information and access to fresher learning or reading or all those kinds of things'.* (DM3)

In response to the list of barriers to professional learning expressed by cooks and directors, a few DMs queried whether directors were building in enough time for menu preparation and allocating time to cooks for this:

*'I mean it also makes me think about the role of the director of the childcare centre in terms of are they actually building in time for that, menu preparation, menu research, etcetera. 'Cause I know in here, that our cook – one of the days that she works is a longer day to enable her have some time to be able to access the computer here and do all that'.* (DM3)

Investment in professional learning was recognised as vital by DMs, not only for the promotion and provision of quality, nutritious food which was safe and culturally appropriate but also for supporting the development of the related skills and connecting nutrition across all NQS quality areas. These related skills included critical reflection, managing eating-related behaviours, building relationships with families, interacting with children, and having a whole of child approach: *'You're making me think about professional learning for educators and that might be a gap 'cause we're not just talking about the cooks'.* (DM3)

### ***Support for professional learning provision (sub-theme)***

DMs were aware that nutrition-related professional development was not easily accessible or available to cooks and educators, as related by a DM who assesses and monitors services, *'There're no surprises there for me actually and some of what they've said [cooks and directors] was reinforced by my perspective of some of those questions around the investment of professional development'* (DM4). The reasons that were shared for the inaccessibility to nutrition-related professional development included: difficulties backfilling a cook when they are in a sole-position; affordability of training; lack of computer literacy for online training; lack of availability of professional development opportunities; lack of leadership commitment and inconsistencies in resources and programs between states.

The change to become 'businesses' by ECEC services was attributed by some DMs for the absence of nutrition-related professional learning in centres:

*'So federal government certainly took the view that childcare services are businesses and that it was up to these businesses to provide professional development for their staff. We know that things are not quite as simple as that. However, basically any access to professional development now is purely fees for service for centres and, as a consequence of that, there's been a severe reduction in demand and attendance for professional development because services just do not want to spend the money'*.

(DM1)

Fee-for-service was viewed as a significant barrier for centres: *'Some of them, I think, could spend the money, some of them probably couldn't'* (DM1). DMs related that centres have a limited professional learning budget and professional development investment depended upon the centre's priorities, with mandatory child safety requirements taking precedence

*'But I guess management's willingness to invest in child professional development means, that for a lot of staff, they don't have access very much at all probably beyond the mandatory things that have to be done'*. (DM2)

Nutrition-related professional development competes with other priorities and the requirement for centres to be financially sustainable: *'some of them don't see the value in it and think it's going to come out of their bottom line'* (DM1). DMs attributed leadership commitment as key to professional learning investment in nutrition. The requirement for

individual professional learning plans was described as leverage for upskilling but this required leadership commitment: *‘Because I think from my experience, if there is no support from leadership, it usually will fall flat. There’s got to be some personal [staff] accountability around, “I want to learn more. I wanna move forward. I have this professional learning plan”’*. (DM2)

Access to professional learning was acknowledged by most DMs as particularly problematic for cooks because they were often in sole positions and backfilling their absence for training with staff was challenging. One DM reflected that as a result most cooks received filtered information via someone else in the centre:

*‘So, most of the training stuff and information of things is filtered through an owner, or a director, a supervisor and stuff like that. So, they’re not always the direct recipient of that information. Somebody else is – they’re relying on somebody else passing that information on as well’*. (DM7)

Another DM wondered how many cooks attended staff meetings for information and were part of a team with a holistic approach to children. Suggestions were the establishment of local support groups for cooks as stated by this DM as ‘a stepping stone to training’:

*‘When you have a collective of cooks, there’s opportunity to do training and it’s actually a bit more economical to do that ‘cause there are a groups of motivated people saying, put something on for us and you have that greater power’*. (DM5)

Notably, a few DMs attributed the ad hoc availability of resources and professional learning to the differences in funding for professional learning between the states, different organisations and models providing nutrition support, and different resources and content in programs. The parochial provision of these by the different states, and lack of consistency, prompted a few DMs to advocate for a national body (preferably government) to provide consistent, evidence-based nutrition related professional development, programs and resources. The issue of inconsistency between states was highlighted by one DM explaining their concerns with disseminating resources through their national networks:

*‘You might be able to adapt it to your state or territory, ‘cause there’s some resources out there, but we’re also aware that we don’t wanna bombard them and*



go, “Here’s a different expectation and here’s eight different ways of thinking about it,” that kind of stuff’. (DM7)

### **Staff beliefs and values (sub-theme)**

A few DMs recognized that childcare staff’s personal beliefs and values around nutrition impacted the implementation of nutrition best practices and conversations with parents. One DM acknowledged that because everyone eats, they have strong values and beliefs around food. The DM described this as *‘a bit of baggage that we all carry around with us – frames our perspectives of food and nutrition’* (DM6). DMs remarked that sometimes educators were having to encourage children to eat healthy food which was very different to the food in educators’ lunchboxes or have conversations with families about the importance of healthy eating knowing that their dinner at home would not be consistent with this advice. The lack of congruence between what educators say at work and their home practices made it uncomfortable for educators to have these conversations with children or families. This was elaborated by a DM who was commenting on the challenges of educators discussing their concerns about children’s nutrition with families, particularly where families provide the food:

*‘So I think food is something that gets leveraged in that situation where people are bringing food into a service and it’s hard for – particularly challenging for educators and services to step over that boundary and go, “You made a decision that this is what your child will eat. I’m in the position where I’ve got to confront you about that and raise it as an issue, whether that’s not acceptable to bring. So, I’m telling you that a decision you’ve made about rearing your child is not allowed in this service.” And that can be a real challenge for educators to deal with, particularly when sometimes what that child is bringing in is mirroring exactly what that educator might have in their lunchbox or sent their children to school with that day’.* (DM7)

Another DM felt strongly about this and advocated for education to be about food, rather than nutrition, as education about nutrition was complicated by people’s ‘baggage’ around what was good or bad:

*'... my personal thought of – is that we're talking food – we're talking about food education. ... I think we all had different views and perspectives on nutrition, and I think that even complicates it a bit more. Just have food education'. (DM7)*

The sentiment that staff's beliefs impacted nutrition practices was highlighted in this quote from another DM when describing barriers to engaging with children's rights around nutrition when staff are unable to look after their own nutrition:

*'One of the tensions I think is that often we have a lot of staff working in the centres themselves who are not able to look after their own nutrition terribly well and there're challenges there. There're probably challenges too in terms of role modelling'. (DM1)*

#### **5.3.2.4 Responsibility and children's rights (Theme)**

##### ***Co-responsibility of individuals and centres (sub-theme)***

DMs believed that the ECEC sector has an essential role in promoting healthy nutrition: *'I think that we as people, that can influence children's nutrition, have a massive role to play in ensuring we get it right for this generation'* (DM3). When asked who was responsible for ensuring ECEC staff have the skills for this, the response was co-responsibility between individuals and directors and centre's owners. This view was shared by two DMs who worked in two very different positions:

*'Well, I think there has to be some personal responsibility as well around wanting to learn and wanting to grow. So, the staff members themselves, the cooks themselves, can initiate some of that, but then they have to be supported by leadership' (DM2).*

*'So, I guess everybody in the workforce has or should have a commitment to their own professional development, so they have the responsibility there. I think if it's an identified need in someone's professional development, I think the employer, or the food provider has the role to support that person to access that in some way'. (DM4)*

While there is 'personal responsibility' to grow and continuously improve, overall responsibility and accountability sit with the leadership position of individual services according to most of the DMs. Service leadership was defined as whoever was in charge of day-to-day management (e.g. the approved provider or director). One DM highlighted the

responsibility of leadership as: *'What do they expect from their educators? And they can't expect them to have all this knowledge if they're not prepared to support them in getting it'*. (DM2)

***Institutional and government responsibility (sub-theme)***

According to government health services in SA, it is not the governments' responsibility to support ECEC professional learning or nutrition-related strategies except in government and education owned services:

*'Everybody immediately thinks of government but, because of the way childcare is set up, actually there're not that many government childcare centres. They're only government if they're on an Education Department site'*. (DM6)

ECEC nutrition was not perceived as being in health's jurisdiction or responsibility because nutrition in children attending childcare is not a SA government nutrition priority. Moreover, the *Health for All Policies* view (Newman, Ludford, Williams & Herriot, 2014), according to one decision-maker, was that most of the determinants for healthy nutrition are outside of health's agency and therefore other departments' business. One decision-maker also reflected that nutrition in centre-based childcare was outside health's remit, but no other department was willing to support centres. One DM related that health historically fulfilled this role but, the expectation that nutrition expertise is provided by the government, was an outdated assumption since 2013 when the government withdrew health promotion support. With regards to training and professional learning, the prevalent opinion was that it is *'potentially childcare's responsibility'*. (DM6)

Some DMs commented that the Government viewed ECEC services as businesses where individual businesses made decisions about nutrition which was disappointing to some DMs. *'So, again, it's not the time and the moment that government particularly sees their responsibility to invest in this sector'*. (DM1)

A senior-level DM believed that current government ideology (i.e. small government, neo-liberal) shifted the responsibility for professional learning and nutrition support to individual services. Legislated requirements of childcare businesses results in a very small margin for funding professional development, as described by a DM commenting from first-hand experience:

*'There are other things that impact on the finances that seemed to be more of a priority for them individually. And services have a limited budget as well for training, I guess, and that depends on how that's shared between the whole staff team. So, again, if there is a priority emerging that a particular aspect or practice that needs professional development, that might be considered a higher priority than some professional development for their chef or their cook'. (DM4)*

One DM credited Government ideology to perpetuating a fragmented system of individual businesses and corporatization of enterprises. This and the casualisation of staff, low pay and devolved responsibility to individual businesses constrained services promoting healthy nutrition:

*'So it's quite a diverse and fragmented scene out there at the moment which is rather alarming and sad because I do understand that childcare as a sector is very poorly resourced, it's relatively low qualification based, there's a lot of casualisation and part-time employees, they're not paid very well, there's a high turnover in services. So, it's not really, in any way, way or form, you couldn't say it's an established, consistent, well-funded workforce at all'. (DM1)*

The counterargument from some DMs was that promoting healthy nutrition is a societal issue, and the responsibility sits with the government to put into place system-wide strategies which support ECEC services.

*'I think the government has a responsibility to have a response to that because it's just like any other type of problem that we might have. So, like the anti-smoking campaign, for example, if we didn't have that years ago, we would all still be smoking'. (DM2)*

*'Undoubtedly' the ECEC sector requires government investment according to some DMs, augmented with a national strategy which addresses the determinants of healthy eating including food advertising and food-product labelling which reaches families, '... I think it requires government investment. I mean if we want make some steady improvements nationally, I think it should be part of the health strategy'. (DM1)*

### ***Rights of the child for healthy nutrition***

When asked to comment on the rights of a child to healthy nutrition the DMs were unanimous that this was not reflected upon enough and poorly understood by ECEC staff.

*'I don't think that it's used enough, reflected upon enough. I think if there's some service out there that has got very high-quality practice, they may have considered that. But I don't think that it's across many people's minds, to be quite honest with you'. (DM2)*

One DM explained that each service places a different value on the UNCRC, with services addressing the Convention as a whole.

*'Individual services and individual approved providers place a different value on that whole Convention. I don't particularly see it promoted in terms of breaking it down, and in the way that you're describing around food and nutrition. I think they address it far more generically'. (DM4)*

The DMs elaborated that, *'I think they probably think they already do that'* (DM4). It was further explained that by focusing on quality area five in the NQS, services believed they were respecting children's dignity and rights: *'I think that's the key focus for them when they're thinking about how that influences their practice, and what that really means for the children in terms of their rights'* (DM4). Two DMs agreed that staff felt they respected children's rights in general. They clarified what this meant for nutrition as,

*'..it's about having access to safe, healthy food, but it's about their [children's] empowerment around that. It's not just the food. It's your engagement with the food and the agency and the right to have an opinion and feel that they can make – have an effect on their lives'. (DM7)*

### **5.3.2.5 Potential solutions**

When asked what could support the promotion and provision of healthy nutrition in centres, some DMs were ambivalent initially indicating that *'I really don't know'* and feeling overwhelmed to suggest a solution. Whereas other DMs identified possible practices that could leverage more support. The requirement for ECEC personnel to have a professional development plan was seen as leverage with the caveat that leadership follow it through.

*'I think if it's an identified need in someone's professional development, I think the employer, or the food provider, has the role to support that person to access that in some way'. (DM3)*

It was acknowledged that the larger enterprises would have a quality officer who could provide advice about professional learning opportunities and that some services capitalized on 'hub groups' where cooks, educators or directors meet from different centres within a franchise or from services within a geographical area for support.

With regards to cooks, some DMs suggested that the minimum qualification for cooks should include *Certificate 111 Early Childhood Education and Care*:

*'I think they should have a minimum requirement of certificate three around the basic information around child development and understanding of the standard, and also food safety, of course, and understanding a little bit about basic understanding of nutrition as well'. (DM2)*

DMs acknowledged that access to affordable and quality professional learning and expert support was crucial but also problematic, *'I think that there're probably limited training opportunities across the sector for this particular aspect of practice'* (SBP). In response to hearing the findings from the cooks' study, some DMs, who provide professional development, were 'rethinking' what cooks required and what was available, and *'whether it's actually what they really need or whether there're things that we could do more readily with more information'*. (DM3)

Professional learning opportunities were needed also for educators particularly with critical reflection and understanding how to work with the NQS: *'I think it really comes down to having a better and deeper understanding of the standards and pushing for high quality'* (DM2). This was elaborated further:

*'And I guess that's the skills that sometimes not everybody has but it's worth thinking about. Using the guideline of the National Quality Standard and looking at ways in which educators maybe able to start to work to solve some of these emerging issues with the children'. (DM2)*

What was suggested was something *'solid around that area'*, a credible 'body' for nutrition support and expertise. An advisory nutrition service was mooted with access to nutrition expertise, resources and training as there was *'a gap in the market'* and *'a real need'*,

*'Well, I think what would be wonderful is some advisory service that can support cooks and educators around a meal provision and food acceptance issues. I think that would be a great resource'*. (DM6)

One DM summarised this as providing a service which directed educators to appropriate professional development opportunities as *'knowing where to go'*. Similar models were suggested which operate interstate and one DM reflected on how a service of this type could be funded:

*'I'm just trying to think of creative ways, of other ways of funding some of these things. I mean obviously government funding is the easy solution, whether if the sector was prepared to pay some levy to help fund on top of support. It's really about having expert advice, and support, and tools available, isn't it?'*. (DM6)

Other suggestions included a program that *'accredited'* a service for meeting nutrition best practice benchmarks and *'something which strengthens policy with families'* (DM2), alluding to stronger engagement between services and families to promote and provide nutrition which was consistent with NQS philosophy.

Two DMs recognised that a national multi-strategy approach was needed which addressed all of the determinants of healthy food choices in children across services, the home and other settings children are exposed to:

*'I don't think you can tackle nutrition until they tackle advertising and food production, it's just so endemic, that we have these contradictory messages. We're trying to teach children about healthy food and they're bombarded with these ads for all these foods that we know...they're so cheap and easy to get'*. (DM1)

This suggestion was described as part of a whole-of-system change, *'So I think like any complex system, you can't just make an adjustment at one part of the system. You've got to adjust them through the system'* (DM1). Although this was not a universal view, several DMs

agreed that this would require state and federal government commitment, *'Look, undoubtedly, I think it requires government investment. I mean if we want to make some steady improvements nationally, I think it should be part of the health strategy'* (DM1). The many solutions suggested by DMs are summarised in Appendix 9 (Professional development suggestions and other solutions from centre-based personnel).

## 5.4. Discussion

By interviewing influential DMs, this study aimed to examine decision-makers' perception of the enablers and barriers identified by cooks and directors to promote and provide healthy nutrition. This study also explored DMs insights into factors which influence nutrition-related decisions and practices. Notably, studies including DMs have not been published in the literature. DMs concurred with several enablers and barriers identified by cooks and directors and added important information about factors affecting nutrition best practice translation into daily routines. Three main themes emerged from an analysis of the findings; how nutrition is positioned and interpreted within the NQS; the crucial role of having a designated cook; and the emphasis on individual responsibility. Central to what DMs shared was the issue of responsibility which is constrained by the organisation of centres as small or medium sized businesses.

### 5.4.1 The NQS as the driver for nutrition systems and practices

Findings demonstrated that the policy environment created by the NQS favours positive nutrition practices and is a powerful driver for the translation of evidence-based nutrition practices into day-to-day routines. Since its introduction in 2012, the NQS has been a catalyst for a paradigm shift in how nutrition is viewed and how nutrition best practice is translated into daily routines. According to DMs this paradigm shift is for children to be considered holistically (see text box) and for nutrition to be across all NQS quality areas. As stated by one of the DMs, *'it's not just the food'*. Using an approach consistent with the NQS and NQF is contrary to the model used in nutrition where nutrition-related guidelines focus on what children should eat, what food groups are not being provided, and how much children should be eating. Notably, nutrition best practice guidelines used in centres are limited to food provision and developed by researchers and health experts with values not



aligned with those of the NQS. In other countries such as Japan, Sweden, France and Finland national healthy eating standards for centre-based childcare and schools are written into law and recognise the broader role of nutrition beyond food provision with embedded strategies for creating learning environments for developing lifelong, healthy eating habits (Ishida 2018; Osowski, Lindroos, Barbieri & Becker 2016; Lucas et al., 2017; Moffat & Thrasher, 2016; Tikkenan, 2009).

The findings in my research highlighted that childcare personnel deliver nutrition and food to children using a broad range of strategies and practices which reflects the centre's staff understanding and interpretation of the NQS. This understanding and interpretation of the standards however varies and is not applied to the same extent by all childcare providers. An example is whether mealtimes are considered as a routine to complete several tasks within a demanding schedule or as an opportunity for children to have agency, develop competencies and, through intentional teaching activities and role modelling, develop healthy eating habits and food literacy.

Another conundrum working within the policy environment of the NQS is the intersection between meeting children's nutrition needs and fulfilling the tenets of the NQS overall. DMs agreed that childcare services have a duty of care to provide and promote healthy nutrition in children but, on the other hand, need to support broader prescribed standards for giving children opportunities to develop agency and competency and respect family's values and responsibilities around food, while providing familiar routines in the centre. Each situation was managed on a case-by-case basis in partnership with parents and DMs assumed childcare personnel had an in-depth knowledge of the NQS, and the expertise and the skills to manage these situations. Considerations which would enable the translation of nutrition best practice within the context of the NQS would include; cooks and educators understanding of the NQS and how nutrition and food is positioned within this; childcare personnel being highly skilled to guide children's developing healthy eating habits; childcare providers monitoring children's dietary intake and mitigating differences between the home and centre; and centre and sector support for childcare personnel to understand and enact the NQS. What was also clear was that educators also needed supporting nutrition professional development as they interacted with children and families daily. Overall, the NQS ethos drove practices and assumed childcare providers were confident in the

interpretation of the standards and how they applied to nutrition beyond what the NQS articulated. Moreover, there was an assumption that childcare providers had the capacity to support nutrition beyond food provision and knew how to do this.

#### **5.4.2 Designated cook and other structural enablers**

Findings from this study suggest that having a designated cook was vital for centres fulfilling their role to promote and provide healthy nutrition. DMs agreed unanimously with directors that cooks played an important role in the delivery of quality services. Cooks were perceived as being the ‘heart’ of the service and central to the success of a service. DMs pointed out that the alternative to centres’ providing food was for parents to do this and this was not in the best interests of the child. This view is supported by the literature with foods provided by parents not being consistent with national dietary guidelines (Briley et al., 2012; Kelly et al., 2010; Nathan et al., 2019, Peterson, 2009; Romeo-Palafox, Ranjit, Sweitzer, Roberts-Gray, Holescher & Bryd-Williams, 2015; Sabinsky et al., 2019, Sweitzer et al., 2009; Sweitzer et al., 2010). Studies of lunches packed for childcare revealed that fruit and vegetables were lacking (Horne et al., 2009), lunchboxes seldom included whole-grain items (Briley et al., 2012; Sweitzer et al., 2010), and that snacks were predominately discretionary (Kelly et al., 2010; Petersen 2009). Educators can advise on what ideally could be provided in a packed lunch but cannot control what comes into the centre, unlike cook supported centres. Having a designated cook enables centres to provide a health promoting menu for a large number of children and provides reassurance to parents that their children are being catered for well (Otten et al., 2017). The corollary of this is that centres can also minimize the risk of exposure to serious allergens (Ierodiakonou, 2016), capitalize on children developing healthy food habits through education, associate learning and role modelling (Ward, Belanger et al., 2017), and deliver nutrition more broadly across all quality areas of the NQS which benefits the child.

Programs, menu planning resources and nutrition training were acknowledged as useful by DMs and described as enabling for the cooks. Studies in SA have shown that multi-strategy nutrition-incentive programs used by services have resulted in positive nutrition-related outcomes (Bell, Hendrie, Hartley, & Golley, 2015; Golley, Bell, Matwiejczyk, & Hartley, 2012; Matwiejczyk et al, 2007; Tysoe & Wilson, 2010), albeit these programs have ceased and

many cooks are using relics of the program. In Australia, other similar programs have had mixed results, with interventions in Victoria and NSW having a positive impact (Bell et al., 2015; de Silva-Sanigorski et al., 2010; Hardy, King, Kelly, Farrell, & Howlett, 2010; Seward et al., 2017; Zask, Adams, Brooks, & Hughes, 2012), and some studies showing no change or mixed results (Finch et al., 2015; Jones et al., 2015; Yoong et al., 2016). Cooks, directors and DMs acknowledged these structural supports, as well as an adequate food budget, as fundamental enablers for cooks to deliver a quality service. Despite the importance of these resources, associated professional development and access to these resources was limited. The reliance on staff experience and the use of professional development and training programs undertaken several years ago was a concern. This concern was particularly relevant when considering cook attrition and new people not having access to these resources, experience or training. The parochial nature of states producing nutrition resources and programs and the considerable turnover of programs and resource packages were also viewed as problematic, necessitating a national approach.

Cooks were valued for their cooking and personality but the importance of the role they fulfilled was undervalued, as suggested by the absence of relevant professional development, and the remit of cooks confined mostly to cooking and a lack of qualifications required for SA cooks. Furthermore, while professional development (PD) can provide generalist nutrition-related knowledge, a distinction must be made that to provide best practice nutrition, which is safe and culturally appropriate, cooks and childcare personnel also need access to professional expertise. This is important given the increasing complexity of changing family food preferences, increasing allergies and other additional dietary needs identified by cooks and directors in my research. DMs speculated that the undervaluing of the cook's role made the role vulnerable to being outsourced or replaced by foods provided by parents if the challenges of providing a flexible menu that met demands became too hard.

DMs emphasized that the roles of the educators were also crucial in supporting children's nutrition and speculated, that at times, educators felt uncomfortable with what they were encouraging children to eat and advising families to provide because the advice was not consistent with their own nutrition practices. DMs elaborated that this incongruence made

it difficult for educators to support nutrition best practices or have conversations with parents about nutrition-related concerns. Other researchers noted this in their studies and recommend nutrition education exploring providers' beliefs and offer opportunities for providers to strengthen their own nutrition behaviours when planning nutrition-related strategies (Hirsch et al., 2016; Lanigan, 2012; Otten et al., 2017; Sisson et al., 2017; Swindle, Patterson, & Boden, 2017).

#### **5.4.3 Shifting responsibility to individual service-providers**

Consistent with the findings with the other studies undertaken as part of this doctorate, professional learning was identified as central to the delivery of quality nutrition-related practices and was noteworthy because of its absence. Underpinning the ambivalence towards nutrition-related professional learning was the apportioning of responsibility. DMs concurred that professional learning is a shared responsibility with the cook or educator and the centre's leadership team. Individuals are responsible for their PD and the centre's leadership team for enabling cooks and educators to receive professional learning opportunities. Constraining service-providers was a limited PD budget with competing priorities, such as mandatory safety training, as well as PD unavailability. DMs sympathized with service-providers and, because of the importance of providing and promoting healthy nutrition to children, believed that the government should support professional development as it was in the interests of society. Government opinion, however, supports the view that nutrition is the service-providers responsibility with a user pay arrangement. The absence of support and inconsistency with nutrition resources prompted a call from DMs for a national approach and a nutrition service, led by the federal government.

According to the UNCRC, governments are responsible for ensuring the services and conditions needed for children to realise their rights are provided. DMs agree that educators do not comprehend the rights of the child to healthy nutrition but view their obligations to the Convention generically. As such, it appears that neither the government nor the ECEC sector are aware of their obligations stipulated by the UNCRC with regards to nutrition.

## 5.5. Conclusion

In summary, studies to date have not included DMs in the published literature. However, the DMs in this study provided insights into unique factors impacting nutrition practices as well as confirming the enablers and barriers raised by cooks and directors. Pivotal to the provision and promotion of healthy nutrition and the implementation of nutrition practices by childcare providers was the NQS. The NQS provided the motivations and guidance for practices and decision-making and was attributed to driving many positive changes since its introduction in 2012.

Not everyone however had a shared understanding of the NQS and how nutrition was positioned within it. The paradigm shift for a holistic view of the child caused dissonance when objectives of the NQS did not align with expert-developed guidelines for the singular-purpose of providing healthy food. Childcare providers were assumed to have the necessary knowledge and skills to facilitate the development of healthy eating habits in children within the NQS approach, beyond what is articulated in the standards and without professional development or access to expertise.

Having a designated cook was also recognised as imperative for the provision and promotion of healthy food, particularly when compared to centres where the food was provided from home as packed lunches. DMs acknowledged that cooks made an important contribution to the delivery of a quality service but drew attention to how the importance of the cooks' role, to provide and promote healthy food, was undervalued. Cooks are provided through goodwill and not as a requirement and, as such, the role of the cook may be vulnerable to being outsourced or replaced by food provided by parents if food provision became too difficult.

Contributing to food provision being too difficult was the absence of timely, available professional development and supporting program frameworks and resources. Information-seeking is a concern for childcare providers not only with regards to nutrition but also with understanding how nutrition is positioned within the NQS and how the standards are interpreted and applied. Attributed to the lack of professional development was a lack of availability, affordability and access; parochial and inconsistent dissemination of supporting

resources; and the onus on individuals for their professional development without means to achieve this.

Australia does not have national nutrition standards for childcare settings and the discourse around nutrition in the NQS, which drives practices, is weak. Moreover, the enablers for the provision and promotion of healthy nutrition such as having a designated cook, resources and system-wide readily available professional development and training, is missing. Strategies to elevate nutrition as a public health priority in our youngest children are urgently needed, as is government support. The premise that children will be supported with the provision of healthy food and environments for learning lifelong, healthy eating habits in settings without policy or structural supports is tenuous. A system-wide approach is needed. In the next chapter, findings from my studies and the literature will be scrutinized using a human rights-based framework. By determining to what extent centre-based childcare services support children's entitlements to healthy nutrition, the provisions of the UNCRC could be invoked to elevate the importance of children's nutrition and mobilise action.

## 6 Chapter Six: A synthesis study and Child Rights Situation Analysis of nutrition practices while in centre-based childcare

### **Preface**

This study examines nutrition and the centre-based childcare setting in the context of children's rights. The findings of the three empirical studies undertaken in the childcare setting (Chapter Five), the reviewed literature in Chapter Two, and the umbrella review (presented at the start of this chapter) are examined using the Child Rights Situation Analysis (CRSA) framework to address the research question posed:

To what extent do centre-based childcare services support children's rights to optimal nutrition and healthy food environments?

A limitation of using the Ecological Model of Health Behaviour (EMHB) as the approach to identifying and exploring influencing factors, is that it does not give an indication of the extent to which these factors are influential or within childcare providers' capabilities to support healthy eating and the development of healthy eating habits in children. By using the CRSA framework developed by UNICEF and Save the Children Fund (Save the Children, 2014; UNICEF Program Division, 2014; UNICEF Division of Policy and Strategy, 2012), the second research question pertinent to my thesis can be answered. The CRSA framework is discussed in detail in the Methodology Chapter (Chapter Three), and its strengths and limitations are presented in the conclusion of this thesis (Chapter Eight).

Following this analysis, the sector's capacity to close the gap between what the provisions in the UNCRC expects duty-bearers to do, and to what extent children's rights are actually fulfilled, is examined in the discussion (Chapter Seven). The significance and implications of these synthesised findings are further discussed in the concluding chapter (Chapter Eight).

## 6.1 Introduction

According to the UNCRC, to which Australia is a signatory, a fundamental right for children is to enjoy the fullest attainment to health through the provision of healthy food (OHCHR 1989). In the UNCRC, Article 24 specifically states that:

'States Parties recognise the right of the child to the enjoyment of the highest attainable standard of health...and shall pursue full implementation of this right and, in particular shall take appropriate measures: ...to combat disease and malnutrition...through the provision of adequate nutritious foods...' *Convention on the Rights of the Child, art. 24*

Articles describe the obligations of signatory States who, under International law, are bound to enact these provisions. When Australia became a signatory in 1991, Article 24 recognised the concerns of children who were malnourished and experiencing malnutrition due to food insecurity. The extension of malnutrition to include obesity and the prevention of NCDs by the United Nations' Special Rapporteurs (United Nations 2014) echoed concerns about the alarming increase in obesity worldwide (Ng et al., 2014). Rates of childhood obesity have more than tripled in many countries since the UNCRC was ratified three decades ago and is a major public health issue in every high income country, most middle-income countries and an increasing number of low income countries, exacerbated by the double burden of malnutrition (Charakida & Deanfield 2018; Lozano et al., 2018; Stanaway et al., 2018). Also, of concern, is the associated increase in NCDs, of which a significant amount could be prevented through dietary changes discussed in Chapter Two.

As discussed in Chapter Two, children's dietary patterns and food preferences are shaped at a very early age by the environment they occupy and by the people they interact with (Gortmaker, 2011; Gortmaker & Taveras, 2014; Sallis & Owen, 2015; Swinburn, Egger & Raza, 1999; Swinburn 2011). The former UN Special Rapporteur on the Right to Health emphasized the need for States to address structural changes in the food environment which negatively impact children's enjoyment of the rights to health and adequate, nutritious food (United Nations, 2014; UN General Assembly, 2014b). Given that healthy



eating habits are established in early childhood (Horodynski & Stommel 2005; Lynch & Smith 2005; Nicklaus et al., 2016; Nicklaus et al., 2009; Skinner et al., 2002), and that the majority of children spend time in formal childcare, centre-based childcare services are the ideal setting to support children to realise their nutrition-related rights.

### *Children not attaining healthy nutrition*

Most children in Australia, however, do not enjoy their right to full health with regards to nutrition. In the most recent Australian Dietary Health Survey reports, a substantial proportion of children still consume poor diets typified by significant amounts of discretionary foods high in calories but poor in nutrients (AIHW, 2010; Johnson et al., 2017). Despite public health efforts for the contrary (Barnes, 2010; Buscemi et al., 2017; Consumers International & World Obesity Federation, 2015; Jones et al., 2017; McGuire, 2012), children's dietary patterns are of increasing public health concern because of the association of excessive energy, high saturated fat, and low vegetable intake with an increased risk of developing obesity and NCDs (Park et al., 2013; Guariguata et al., 2014; Wang et al., 2014). One in four children currently meet the WHO definition of overweight or obese even before they start compulsory schooling (AIHW, 2018b). As a result of poor dietary habits and excessive body weight, even children bear the burden of NCDs, increasing to significant proportions as adults (Charakida & Deanfield, 2018; Craigie et al., 2011; Finucane et al., 2011; Haddad et al., 2015; Kyu et al., 2018; Lozano et al., 2018; Stanaway et al., 2018).

Concern for children's health is reflected in some state and territory public health strategies which state that centre-based childcare services as ideal settings for promoting healthy nutrition because of its reach to significant numbers of children and families (Chronic Disease Prevention Directorate, 2017; Department Health & Ageing, 2016; Government of South Australia 2011; NSW Ministry of Health 2013; NT Government, 2015; State of Victoria, 2019). A summary of the current programs implemented in NSW, the Australian Capital Territory, Queensland and Western Australia are listed in Appendix 10. In the ECEC sector, a transformational change in 2012 extended the role of childcare services providing care to include education and health. The peak intergovernmental forum in Australia, the Council of Australian Governments, introduced the National Quality Framework and a system of

regulation and accreditation in the ECEC sector which would drive continuous improvement in centre-based childcare, including practices to encourage healthy lifestyles in children (ACECQA, 2018). This Framework, discussed in more depth in Chapter two, is underpinned by the principles of the UNCRC which are acknowledged in several ECEC directional documents to promote, protect and fulfil children's rights.

### *Child rights-based approach*

Unhealthy foods and malnutrition have been raised as human rights issues and used to address childhood obesity (Greenway, 2008), food advertising directed at children (Handsley et al., 2014; Granheim et al., 2019), and school meal provision (Moffat & Thrasher, 2016; Mikkelsen et al., 2016). In all of these examples a child rights-based approach has been used employing the UNCRC as a human rights instrument to discuss to what extent the UNCRC provisions can be utilised to improve healthy eating. As signatories to the UNCRC, States are not obliged to have every child achieve the fullest attainment of health but are beholden to make available the conditions and services necessary for optimal nutrition. A few studies have used this approach with school meals (Moffat & Thrasher, 2016; Mikkelsen et al., 2016) but, to the best of my knowledge, a child rights-based approach has not been used in early education and care settings with regards to nutrition.

The purpose of this study is to identify to what extent centre-based childcare services support children's rights to optimal nutrition and healthy food environments. This will be undertaken using the findings from the three empirical studies, the literature discussed in Chapter Two and the umbrella review (Matwiejczyk et al., 2018), against the CRSA framework. As such, this is a synthesis study.

## **6.2 Method**

The analysis using the CRSA framework is undertaken in five steps. Firstly, the public health nutrition-related issue of concern pertinent to childcare is summarised (issue identification), and its immediate, underlying and fundamental causes listed (casual analysis). The causes are drawn from the literature and from the findings from the three empirical studies

undertaken as part of this thesis. Next, the duty-bearers in centre-based childcare services and their role and responsibilities (role analysis) are identified. This is done concurrently with identifying duty-bearers' capacity to act and realise children's rights (capacity gap analysis). These two steps are also informed by the collective findings from the three empirical studies presented in Chapter Five. Lastly, the rights that are at risk of not being realised are identified (rights not realised). Details about children's rights and the articles most relevant to nutrition and to the ECEC sector are described in depth in Chapter Two. A further discussion of this analysis is undertaken in Chapter Seven. The results against each of the five steps of the CRSA are presented as follows.

## **6.3 Results**

### **6.3.1 Child Rights Situation Analysis: Issue identification**

Public health proponents, researchers and experts have problematised nutrition in childcare as two main issues of concern:

- Across Australia, children's diets are not consistent with the national dietary guidelines (NHMRC, 2013), with high energy, nutrient-poor foods, known as discretionary foods, contributing up to 40% of a child's total energy intake (ABS, 2018, Johnson et al., 2017).
- As such, overconsumption of particularly discretionary foods (Johnson et al., 2017) is attributed to one in four children being overweight or obese (AIHW, 2019, Australian Institute Family Studies 2019). Once established, poor dietary habits and excessive weight carries through into adulthood (Walls et al., 2012) and contributes to the prevalence of NCDs and its physical, social, psychological and economic costs to individuals, communities and society (Flegal, Kit, Orpana, & Graubard, 2013; Ng et al., 2014; Puhl & King, 2013; Sanders et al., 2015).

It is rationalised by researchers and experts that nutrition-related interventions in childcare centre settings are necessary because children spend considerable amounts of time in these services during an influential window of development when healthy food preferences and healthy eating behaviours are developing and likely to track into adulthood (Craigie, Lake, Kelly, Adamson, & Mathers, 2011; Lee et al., 2010; Mikkila, Rasanen, Raitakari, Pietinen, &

Viikari, 2005). Providing children with nutritious food to meet their developmental needs and in an environment that fosters healthy lifelong habits, is crucial (Consumers International & World Obesity Federation, 2015; United Nations General Assembly, 2011; WHO, 2016; WHO, 2017). It is known from a review of 12 systematic reviews undertaken between 2010 and 2016 that interventions promoting healthy nutrition result in positive dietary outcomes in children in childcare (Matwiejczyk et al., 2018), although few affect anthropometric measures used as an indication of preventing obesity (Mikkelsen et al., 2014; Morris et al., 2014; Stacey et al., 2017; Wolfenden et al., 2016).

Findings from intervention studies focused on children have been used to inform evidence-based best practice nutrition guidelines for supporting very young children (NHMRC, 2013). However, there is a paucity of studies examining whether evidence-based nutrition-related recommendations are embedded within childcare centres as routine practices.

Furthermore, an umbrella review of 12 systematic reviews undertaken as part of this thesis (Matwiejczyk et al., 2018) suggest that positive dietary outcomes can only be achieved in children in childcare with a nutrition-expert or researcher led intervention. Nevertheless, the issue for governments is the poor national diet of children and alarming rates of childhood obesity which collectively increase children's risks for developing NCDs as they get older.

### **6.3.2 Child Rights Situation Analysis: Causal analysis**

#### *Immediate and underlying causes*

Overconsumption of food and the storage of excessive energy as body fat is attributed to the inconsistency of diets with the national dietary guidelines and contributing to childhood overweight and obesity, (NHMRC, 2013). Foods associated with overconsumption and popular with Australian children are typically discretionary foods which provide significant amounts of energy, saturated fat and salt with few protective nutrients (Johnson et al., 2017). Previously described in Chapter Two, the underlying causes contributing to overconsumption and excessive weight are very complex and attributed in part to unhealthy dietary patterns established in childhood (Baur, 2019; Birch & Doub, 2014) and shaped by the environment children live in (Gortmaker, 2011; Gortmaker & Taveras, 2014). The home

environment has been the primary influence (Peters, Parletta, Campbell, & Lynch, 2014) but, for many young children, centre-based childcare has become influential following societal changes in mothers' workforce participation (Briley & McAllaster, 2011; Laughlin, 2013). Nearly ten years ago, Briley and McAllaster (2011) observed that childcare centres had become the learning environment for developing healthy eating habits highlighting the potential for childcare settings as places for promoting lifelong, protective healthy eating habits.

It is beyond the scope of this thesis to examine the underlying causes of overconsumption, obesity and diet-related NCDs in young children but it is suffice to refer to the work of others who have identified the multifarious causes that influence children's dietary patterns (Finegood, Merth & Rutter, 2010; Keaver, Webber, Dee, Shiely, Marsh, Balanda & Perry, 2013).

#### *Immediate and underlying causes in childcare centres*

A growing body of research and systematic reviews suggests that attendance at non-parental childcare is associated with an increased risk of developing obesity (Alberdi et al., 2016; Black, Matvienko-Sikar, Kearney 2017; Swyden, Sisson, Lora, Castle & Copeland, 2017), however these findings are inconsistent with other studies which show that there is no association (Alberdi, et al., 2016; Black et al.,2017; Costa et al.,2017; Swyden et al., 2017). Researchers concurred that differences in type of childcare and intensity of use made it difficult to explore associations between children attending childcare and increased risk of obesity and concluded that evidence is inconclusive for a relationship between childcare and obesity risk (Alberdi, et al., 2016; Black et al.,2017; Costa et al.,2017; Swyden et al., 2017). Nevertheless, centre-based childcare was less commonly reported as having an association although most studies reported mixed findings or no association (Swyden et al., 2017). The exception was the US initiative, Head Start, where three of 10 studies reported a negative relationship with an increased risk of obesity, and the other studies reported no association (Swyden et al., 2017). Most of these studies were cross-sectional and a recent review of the literature examining longitudinal associations between non-parental childcare, diet, and activity behaviours found no or mixed evidence of a longitudinal association (Costa, Benjamin-Neelon, Winpenny-Phillips & Adams, 2019). Of the 63 tested

childcare/outcome associations for diet, 59% showed no association and the remainder were mixed (Costa et al., 2019). There are clear results from previous studies but the quantity of data is insufficient to demonstrate any effects. Researchers have called for more research to investigate the associations of non-parental childcare on diet and how they contribute to, or protect against, the development of excessive weight gain in young children (Alberdi, et al., 2016; Black et al., 2017; Costa et al., 2017; Costa et al., 2019; Swyden et al., 2017).

In childcare centres, research over the last few years has taken a socio-ecological approach with a relatively small number of studies exploring what factors influence nutrition-related decisions and at what levels of influence (Gubbels, Van Kann et al., 2014; Hirsch et al., 2016; Larson, et al., 2011; Lynch & Bartel, 2012; Otten et al., 2017; Ray et al., 2016). In the research informing this thesis, an Ecological Model of Health Behaviour was used to further this work and identify the factors influencing nutrition decision-making and best practice according to childcare cooks, directors and key decision-makers. The EMHB is an iteration of the socio-ecological model originally developed in the 1960s (Sallis & Owen, 2015). The factors influencing the translation of nutrition best practices into daily routines from the childcare personnel interviewed (n=33), and findings from the three empirical studies in my research, are summarised in the figure below (Figure 6-1: Individual, centre, institutional (sector) and societal level factors influencing nutrition practice in centre-based childcare).

The levels of influence are similar to those identified by other researchers from the US, Canada and Finland (Hirsch et al., 2016; Lynch & Bartel, 2012; Otten et al., 2017; Ray et al., 2016) but include several factors not previously identified that shape the food, social, information and policy environments. All four researchers who used a socio-ecological framework identified the following three levels of influence, which were also identified in my studies: the individual-level (also called the interpersonal, individual factors, child-level and personal by other researchers); centre-level (also called community, social and physical environment and centre-level by other researchers); societal-level (also called societal-level or macro-level by one researcher) (Hirsch et al., 2016; Lynch & Bartel, 2012; Otten et al., 2017; Ray et al., 2016). Figure 6-1 shows the different factors at the four levels of influence that impact nutrition-related decisions in centre-based childcare. Several of these factors

are specific to SA, however, on closer examination they are also of relevance elsewhere. For example, the perceived effect of the NQS on practices is a case in point of how policy at the sector level in any country or Australian state, or territory, would influence food provision and nutrition best practices. Moreover, viewing the findings from all three empirical studies of the key influencing barriers and facilitators at various levels of influence highlights the complexity and inter-relatedness of factors determining food provision and nutrition practices. This shifts the focus from considering the cook and food provision as the primary focus of nutrition in centre-based childcare and broadens our view to consider other influencers and the holistic approach influencing children's nutrition.

Missing from other studies, but illustrated in this figure, are the factors attributed to the institutional level of influence. Researchers in the other studies that used a similar approach identified three levels of influence rather than the four, except for perhaps Otten et al., 2017. These comparisons with my research findings have been discussed in the studies presented in Chapter Five and will be elaborated on in the discussion (Chapter Seven).

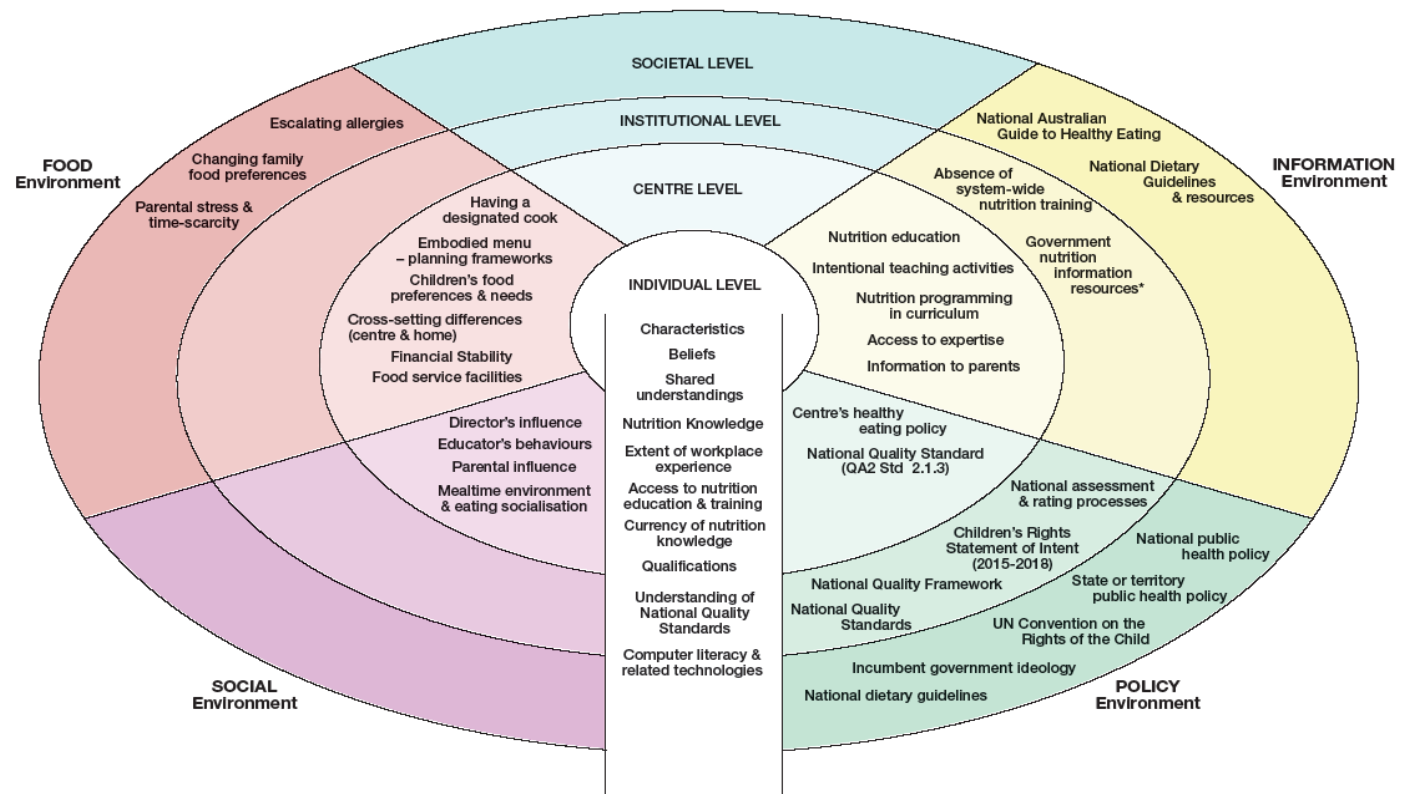


Figure 6-1: Individual, centre, sector and societal level factors influencing nutrition practice in centre-based childcare



### *Immediate, underlying and structural causes from the research in this doctorate*

Missing from this causal analysis is data from childcare centres for both collection and monitoring. As part of this doctorate, the findings for the immediate, underlying and structural causes for diets inconsistent with the national dietary guidelines are summarised below ( Table 6-1: Immediate, underlying and structural barriers and causes to translating nutrition best practice into routines). These findings from the studies with cooks, directors and influential decision-makers are from a limited number of participants but the qualitative approach provides rich data and insights. A few of the causes listed are supported by findings in other studies reported in the literature and are in bold. Notably, some have not been reported elsewhere and reflect the contribution my research makes to the body of evidence. These summarised findings provide an awareness of what provisions within the UNCRC might not be realised, which is presented in the next step.

### *Food provision*

A special mention relating to food provision needs to be acknowledged here because the literature and many of the current nutrition-related programs in centre-based childcare address food provision (Appendix 10). In Australia, studies in the last five years in Queensland, NSW and Western Australia revealed concerns in food provision in childcare settings (Cole, Vidgen, & Cleland, 2017; Finch, Jones, Yoong, Wiggers, & Wolfenden, 2016; Finch et al., 2019; Jones et al., 2015; Jones et al., 2017; Yoong, Skelton, Jones, & Wolfenden, 2014; Samball, Devine & Lo, 2014; Wallace, Costello & Devine, 2017). The paucity of Australian and international studies reporting on the quality and quantity of foods provided in early education and care settings is surprising given the substantial proportion of children in childcare over the last thirty years. In most countries, it appears that food provision in centre-based childcare has room for improvement. In NZ, only 5% (n=3) of the 287 childcare centres who participated in a national study had a menu that met all 10-scoring criteria (Gerritsen et al.,2017). Most menus did not meet national dietary guidelines for quantity and variety and did not limit discretionary foods. Similarly, in the US (Copeland et al., 2013; Erinoshio et al., 2013; Erinoshio, Dixon, Young, Brotman & Hayman, 2011; Dixon et al., 2016) and in Europe (Gubbels et al., 2014), Ireland (Molloy et al., 2014) and the UK (Evans, Cleghorn, Greenwood, & Cade, 2010) menus were not consistent with national dietary

guidelines. These menus were characterised by providing excessive amounts of energy and salt, and inadequate amounts of vegetables, cereal-grains and protein-rich foods.

**Table 6-1:** Immediate, underlying and structural barriers and causes to translating nutrition best practice into routines

Immediate causes*	Underlying causes	Structural causes
Lack of up-to-date knowledge regarding nutrition	Insufficient nutrition education for childcare providers because of cost, unavailability, competing priorities	Not prioritised in national public health plans
Unawareness of changed guidelines for introduction of foods to prevent allergies	Absence of training and mandatory nutrition-related qualifications for cooks	Not prioritised in state-wide public health plans
Lack of skills for a responsive menu to match demands	Delivery of education and information being replaced with technologies	NQS nutrition-related standard too broad for operationalising
Lack of current, accessible and nationally consistent menu planning resources	Unavailability of funding for programs or other strategies to assist centres and cooks	Absence of system-wide, nutrition-related training and education for staff across SA and nationally
Reliance on rescinded menu planning guidelines and tools	Changing family food preferences	Having a designated cook and professional development not a requirement in National Quality Framework
Lack of cook's computer literacy	Significant incidence and increasing prevalence of food allergies in children	Absence of nationally consistent menu-planning guidelines and resources, led by ECEC sector
Difficulty backfilling cook for professional development	Cross setting differences between centres and the home	Lack of universal access to nutrition expertise, particularly in SA
Restrictive menus with reduced food variety to accommodate allergies	Parental stress and time-scarcity influencing children's developing dietary patterns	Organisation of the sector as small or medium-sized businesses with limited opportunities for shared strategies, communication and collaboration
Nutrition training and education for staff not prioritised	Each centre is a business with minimal government support for nutrition	
Absence of accessible, available, affordable nutrition education to staff		
Attrition of experienced cooks		
Replacement of cooks or chefs without training in nutrition specific to childcare		
Some cooks set in their ways and perceived resistance to making changes		
Children's food pickiness, food refusal		
Children mirroring food pickiness		

\* as perceived by childcare personnel in the research undertaken in this doctorate

There is a lack of, or very limited, data available on what proportion of children's diets come from childcare services in Australia or internationally (Lucas et al., 2007) and a paucity of studies examining what foods are provided in childcare settings. The few studies published in Australia childcare settings could do more to provide foods consistent with their respective national dietary guidelines (Cole et al., 2017; Finch, Jones, Yoong, Wiggers, & Wolfenden, 2016; Finch et al., 2019; Jones et al., 2015; Jones et al., 2017; Yoong, Skelton, Jones, & Wolfenden, 2014). Nevertheless, intervention studies and systematic reviews provide evidence that nutrition best practices in childcare settings can result in positive dietary outcomes in children, as mentioned previously, and a small number of studies suggest that this can be extended to influencing children's dietary intake at home (Tysoe & Wilson, 2010, Robson et al., 2015). With regards to centre-based childcare, there is insufficient data to know how the early education and care settings contribute to the immediate and underlying causes of overconsumption and excessive weight gain.

### **6.3.3 Child Rights Situation Analysis: Relevant rights at risk of not being realised**

In Chapter Two, the provisions within the UNCRC that could support jurisdiction decisions to provide healthy meals for children were identified. The UNCRC provisions that address a child's right to the highest attainment of health include the; right to optimal nutrition (nutritious food and adequate amounts of food); the right to education and information related to nutrition; support for educators to enact best practice that creates the services and conditions for optimal nutrition; and for decisions to be made in the 'best interests' of the child. It is these rights which are at risk of not being realised and will be examined more as follows.

#### **6.3.3.1 The right to optimal nutrition (art. 24)**

According to Article 24 in the Convention, States Parties recognise the right of the child to the enjoyment of the highest attainable standard of health and are obligated to facilitate the realisation of this through measures that combat disease and malnutrition. For children in childcare, food provision must meet national dietary recommendations for the promotion of a healthy weight and the prevention of NCDs, contain the necessary nutrients and

macronutrients for healthy growth and development, be culturally appropriate, and be available and accessible (NHMRC, 2013).

In this thesis, it has been established that children's entitlement to adequate, nutritious food in centre-based childcare is not being met in Australia (Cole et al., 2017; Finch, Jones, Yoong, Wiggers, & Wolfenden, 2016; Finch et al., 2019; Jones et al., 2015; Jones et al., 2017; Yoong, Skelton, Jones, & Wolfenden, 2014). This is particularly the situation where food is provided from home as packed lunchboxes in both Australia (Kelly et al., 2010; Nathan et al., 2019) and in comparable countries (Johnston, 2013; Nathan et al., 2019; Peterson, 2009; Romeo-Palafox et al., 2015; Sabinsky et al., 2019; Sweitzer et al., 2010). In SA, adequate, nutritious food was provided in centre-based childcare with positive dietary outcomes (Bell, Hendrie, Hartley, & Golley, 2015; Golley, Bell, Matwiejczyk, & Hartley, 2012; Tysoe, 2010) but the programs, professional development and external expertise enabling this were defunded in 2013 and not replaced.

In the studies undertaken as part of this doctorate, childcare personnel believe that healthy nutrition is important; however, my study focussed on cooks suggests that providing nutritious food is under threat and possibly not sustainable (Chapter Five). Overall, children's rights for optimal nutrition and the conditions and services which enable this (art. 24) appear to be at risk of not being realised.

#### *Reasons for non-compliance*

Centres are required to demonstrate to state regulators how they meet the national quality standard 2.1.3 that '*Healthy eating and physical activity are promoted and appropriate for each child*' (ACECQA, 2018). The translation of this directive into practice is not, however, fully implemented. Reasons for this, identified as part of this doctorate for food provision, included a lack of: currency of nutrition knowledge and skills; professional development; accessible menu-planning resources and tools; consistent, national menu-planning guidelines and support and; access to nutrition expertise.

At the societal level a number of demanding factors further challenged the sustainability of healthy food provision stipulated in the NQS (QA2 Element 2.1.3). These demands were

attributed to escalating allergies, changing family food preferences, parental stressors and changing parental expectations. At the institutional or sector level directional policies, particularly the NQS, had the broadest affect influencing the food, social and information environment but also childcare providers' beliefs, motivation and ideological commitment. However, limitations of the NQS, discussed in the previous studies in Chapter Five, constrained the translation of nutrition best practice into daily routines. The NQS was not equally understood by all and where the holistic and aspirational approach of the NQS intersected with prescriptive nutritional requirements developed by health experts, some dissonance was created. Furthermore, the mission of childcare providers to support the development of healthy eating habits in children as a duty of care was at times challenging in the face of significant cross-setting differences in food preferences and food practices between the home and the centre. This phenomenon has been reported elsewhere by Gubbels et al., (2018). At the centre-level, an absence of structural supports (such as menu-planning guidelines and supporting resources), the attrition of experienced, long-standing cooks and replacement staff, including chefs or cooks from the aged sector, without nutrition training, constrain nutrition-related decisions. There was also a lack of support and access to expertise from the nutrition and health sectors, with the state government in health perceiving centre-based childcare as being outside of their scope of responsibility (Chapter Five).

Overall, children's rights to adequate, nutritious food in childcare that enables children to enjoy the highest attainable standard of health and develop healthy eating habits that prevent NCDs and obesity, are at risk of not being fulfilled.

### **6.3.3.2 The right to nutrition information and education (art. 17, art 24 (d))**

The other rights at risk are children's entitlement to access health promotion information and education in all its forms (art. 17, art. 24 (d)) and for States to provide information and support for its use (OHCHR,1989). Accumulating evidence supports the premise that food literacy in young children helps promote healthy attitudes towards food and positive dietary changes (Dazeley & Houston-Price, 2015; Horne et al., 2011; Sigman-Grant et al., 2014).

Centre-based childcare specialises in education and is ideal for meeting this provision. There were many examples of intentional teaching activities developing children's food literacy quoted as examples in the studies undertaken as part of this thesis (Chapter Five), ranging from food literacy conversations at mealtimes to 'paddock to plate' programs where children grew food at the centre, harvested it, prepared it and ate it.

Parents, as secondary right-holders, have the same rights as their children to information and education (OHCRC, 1989). From the umbrella review undertaken as part of this thesis and discussed in Chapter Four, even small amounts of parental engagement with childcare services correlated with positive dietary outcomes for their children at home (Ling, Robbins, & Wen, 2016; Morris et al. 2014). Scarcity of time and parental stress is attributed in the literature to parents not engaging with childcare services (Bauer et al., 2012; Jastroboff et al., 2018; Mehta et al., 2019), although parents valued healthy nutrition for their children (McSweeney, et al., 2016). Findings from my studies demonstrated that directors and DMs were cognisant to the stressors experienced by parents and valued regular communication with them. To reduce the burden on parents, several services offered free or subsidised meal packs for families to take home or free food from food relief organisations (Chapter Five).

Some childcare providers in my studies also believed that some parents needed education about healthy nutrition and used informal chats to do this. The view that parents need education is common with other studies (McSweeney et al., 2016; Cole et al., 2017; Lynch et al., 2014; Van de Kolk et al., 2018) and reflects the belief that food provided from centres is healthier than foods provided at home. Through centres' facilitating information exchange and knowledge transfer, childcare providers can help fulfil parents' rights to nutrition education and information. Overall, parents of children receiving childcare services are entitled to nutrition information and education, but findings from my studies suggest these rights are at risk of not being realised as there are several barriers to parental engagement and little evidence of parental involvement with centres.

### 6.3.3.3 Children's rights for best practice

#### **Best practice and support for childcare providers (art. 27)**

The Convention recognises that parents or responsible others have an obligation to care for the child and must create healthy conditions for children to develop within (art. 27 (2)). Furthermore, State Parties must render appropriate assistance to those enacting child-rearing duties (art. 18 (2)) and *'take all appropriate measures to ensure that children of working parents have the right to benefit from childcare services'* (art. 18 (3)). Also bestowed to State Parties is that they must take appropriate measures to assist parents and others responsible for the child to implement this right, particularly with regards to nutrition (art. 27 (3)). These articles within the UNCRC are embedded within the National Law (2010) and Regulations (2011) and articulated as a principle that *'best practice is expected in the provision of education and care services'* (Education and Care Services, 2010, Section 3). As previously discussed, findings from this doctorate suggest that directors and DMs accept their role and responsibilities with regards to complying with the Convention to care for the child but are unaware of their obligations to support the provisions related to optimal nutrition. It can be said that educators' capacity to meet their obligations, with regards to nutrition, within the context of Art. 27, are reduced.

#### *Reasons for non-compliance*

Reasons for gaps in capacity are attributable to a lack of resources and mechanisms to support or enable action, as described previously. Where the government has failed childcare services include: an absence of ongoing relevant training and expertise at the system-level; a lack of state-led programmatic solutions or supportive mechanisms; an absence of childcare settings as a public health focus in state-level health plans; and defunding health promotion initiatives supporting childcare settings since 2013. It is vital that governments recognise childcare services as powerful settings for supporting children's short-term and long-term nutrition through supporting childcare providers (OHCR, 1989). Given the government's position on not supporting nutrition-related childcare services in SA, meeting these rights is at risk of not being fulfilled (Chapter Five).

#### **6.3.3.4 Children's rights for their best interests to be considered (art. 3)**

The Convention recognises that 'in all actions concerning children' the best interests of the child shall be the 'primary consideration' (art 3. (1)). This provision governs all decision-making processes for all actions relating to children (Logan, 2008) and is explicit in the legislated National Law (2010), Regulations (2011), and Early Years Learning Framework (DWEER 2009) which guides ECEC services. Moreover, according to article 3., State Parties will ensure that services will conform to the standards established by competent authorities, particularly in the area of safety and health (art. 3 (3)). Very young children are reliant on ECEC personnel to guide them and provide the services and conditions for healthy eating behaviours and healthy food provision in childcare (Ward et al., 2016). Findings from the studies in this thesis suggest that children's best interests with regards to nutrition, and in relation to children's rights, are at risk of not being fully realised.

##### *Reasons for non-compliance*

Where children's rights to optimal nutrition and the services and conditions supporting this right are not fulfilled, the consensus is that decisions have not been considered in the best interests of the child (Logan, 2008). Given that articles 24, 17, 27 and 3 are not fully realised, it can be claimed that children's right, for their best interests to be considered, are not fully realised.

#### **6.3.4 Child Rights Situation Analysis: Roles and responsibilities analysis and capacity analysis**

##### *Role analysis and capacity analysis*

Before exploring the capacity of childcare services to provide the necessary conditions and services for children to realise their rights, the roles, actual and potential, of a range of key stakeholders need to be identified and examined. Using the CRSA framework, children are right-holders and parents of children are secondary rights-holders who can claim rights on behalf of their children. As a signatory of the UNCRC, the State is the primary duty-bearer responsible for children's rights being respected, protected and fulfilled (UNICEF Program Division, 2014). As such, the State is obligated to provide services and conditions for optimal



nutrition and healthy eating behaviours (art. 24) according to the UNCRC (1989). In the next section, the roles and responsibilities of the various State Parties and of the non-state actors as duty-bearers are examined in more detail and the capacity of the roles to fulfil the provisions relating to nutrition are explored. The capacity of each duty-bearer to provide the authority to elicit change and the resources to support the necessary conditions and services is commented on, as is the duty-bearers level of motivation to realise children's rights.

According to the CRSA, a duty-bearer who has authority accepts their responsibility to support children's rights and meet their obligations as described by the UNCRC, as well as the authority to carry-out their role. Whether the duty-bearer accepts their responsibility reflects, in part, their motivation to support children's rights. Lastly, a duty-bearer is considered to have the necessary resources to provide the needed conditions and services if they have the necessary knowledge, skills, organisational, human and material resources.

#### **6.3.4.1 Roles and responsibilities of the State Parties**

As the primary duty-bearer, State Parties are obligated to support provisions within the Convention through legislation and other measures (art. 4, OHCHR, 1989). Measures employed by the State to support rights holders (i.e. children) include legislation, regulations, policies, practice guidelines and programs. Australia has the Australian Dietary Guidelines (NHMRC, 2013) which are not legislated but are evidence-based and considered nutrition best practice. Most states and territories also have public health strategic plans which prioritise areas of health and include policies and programs (Chronic Disease Prevention Directorate 2017; State of Victoria, 2019; Dept NT Health, 2015; NSW Ministry of Health 2013). Four of the seven strategies prioritise childcare settings as a focus for intervention for healthier lifestyles (Chronic Disease Prevention Directorate, 2017; State of Victoria, 2019; Dept NT Health, 2015; NSW Ministry of Health, 2013). In addition to these, every state and territory refers to regulations in their policies that support the assessment and rating of childcare services against the NQS (ACECQA, 2018). Within the ECEC sector several examples of interdepartmental legislation and policies facilitating child rights have been identified elsewhere (Chapter Two) and include the *National Law and Regulations*

which make up part of the National Quality Framework (Australian Children's Education Care Quality Authority, 2018) and the *Early Years Learning Framework* (Department of Education Employment and Workplace Relations, 2009). The *Early Years Learning Framework* (EYLF) is underpinned by children's rights although the policy document lacks specificity about children's rights for healthy nutrition.

In addition to embedding child rights in various measures, the State is also obligated to support the capacity of educators to enact the services and conditions needed for children to realise their rights (art. 27 (3), art. 3 (3)). In the absence of national guidelines specific to nutrition in childcare settings, each State and territory has responded with voluntary menu-planning guidelines, but these are inconsistent (Chapter Two). Notably, SA does not receive government support or funding for nutrition services or programs in centre-based childcare (other than the Children's Centres), unlike the situation in other states (Chronic Disease Prevention Directorate, 2017; State of Victoria, 2019; Dept NT Health, 2015; NSW Ministry of Health, 2013). Existing services were defunded in 2013 at the state and federal level, and, according to findings from studies focussed on cooks and directors in this thesis, most SA centres are drawing upon rescinded nutrition programs and resources.

Other non-state actors such as the organisations and services which make up the ECEC sector are also duty-bearers, and it is the State's additional responsibility to raise awareness among other duty-bearers of children's entitlements to services and conditions that foster healthy eating and healthy behaviours, and how to implement them (art. 42 OHCHR 1989). As discussed in the previous section, however, the organisational structure of centres as small or medium sized businesses favours business principles and, as such, constrains the role and responsibility of centres (Chapter Five). As businesses without state government support, centres take personal responsibility for funding nutrition education and resourcing. Funding nutrition competes with many other professional development needs which are mandatory.

Overall, the motivation for the federal and state government to accept its obligations as duty-bearers is dependent upon the ideology of the incumbent governments. Neo-liberalism favours a philosophy of a small government i.e. a government with few constraints on businesses through regulations and policy (Acker, 2008; Mayes & Oliver, 2012; Raphael,

2015). Key to liberal democratic governments is the notion of personal choice and of how people are responsible for themselves and others. Ostensibly, personal matters, such as childcare and lifestyle behaviours affecting health are matters of the private realm (Acker, 2008; Mayes & Oliver, 2012; Raphael, 2015). As both the federal and South Australian state government have small government values (Wutzke et al., 2018), it can be argued that they do not accept their responsibility with regards to the conditions and services for optimal nutrition in relation to children's rights. In SA this is reflected in an absence of a state public health plan or any resourcing of the childcare sector for healthy nutrition and obesity prevention. Within the ECEC sector, there is the potential for State Parties to support the realisation of children's rights as they have the authority and resources but not the motivation.

#### **6.3.4.2 Roles and responsibilities of the ministries**

Civil servants responsible for centre-based childcare services and employed in the South Australian Department of Education (previously Department of Education and Children's Services DECD) and in the Department of Health have the same obligations and responsibilities described for the State Parties at the highest government level. The government-arm of the ECEC sector includes the Health Standards Board who are responsible for assessing and rating centres for accreditation and the Department of Education who oversee the 47 Children's Centres. From the studies undertaken in this thesis, the Health Standards Board has the authority, the resources, and the motivation to support the realisation of children's rights. However, the Board does not take responsibility for children fully realising their nutrition-related rights.

In the SA Department of Health, the section responsible for developing the State public health policy and enacting Federal policy is Wellbeing SA (previously SA Health). This section is not able to accept their responsibility to support a child's right to the conditions and services for optimal nutrition. They however do have the potential to support the realisation of children's rights as they have the authority and resources but not the motivation.

#### **6.3.4.3 Role and responsibilities of the centre-based childcare service**

Parents are secondary rights holders but also significant duty-bearers, responsible for their child's health and development and for acting in the best interests of their progeny. When parents entrust childcare services to care for their children, there is a tacit agreement that the service is taking on parental responsibilities as proxies. This is consistent with the nested responsibility model (Kent 1994) where, in the absence of the key duty-bearer, those most proximal in the next layer of responsibility, takes on that role.

By parents transferring this responsibility to childcare services, the service is obligated to respect, protect and fulfil the rights of the child for optimal nutrition and health (art. 24 OHCHR 1989). This obligation includes;

- Providing a wide variety of healthy food that meets children's developmental and nutritional needs, and fosters healthy food preferencing.
- Providing a social food environment for children to develop healthy food preferencing, a positive attitude to food, self-regulation and eating to appetite
- Providing nutrition education and information for the children
- Providing the food, social and information environment that fosters healthy diet-related behaviours that prevent NCDs and malnutrition.
- Increasing the capacity of childcare personnel to enact best practice
- Providing nutrition education and information for childcare personnel and parents, who support the children.

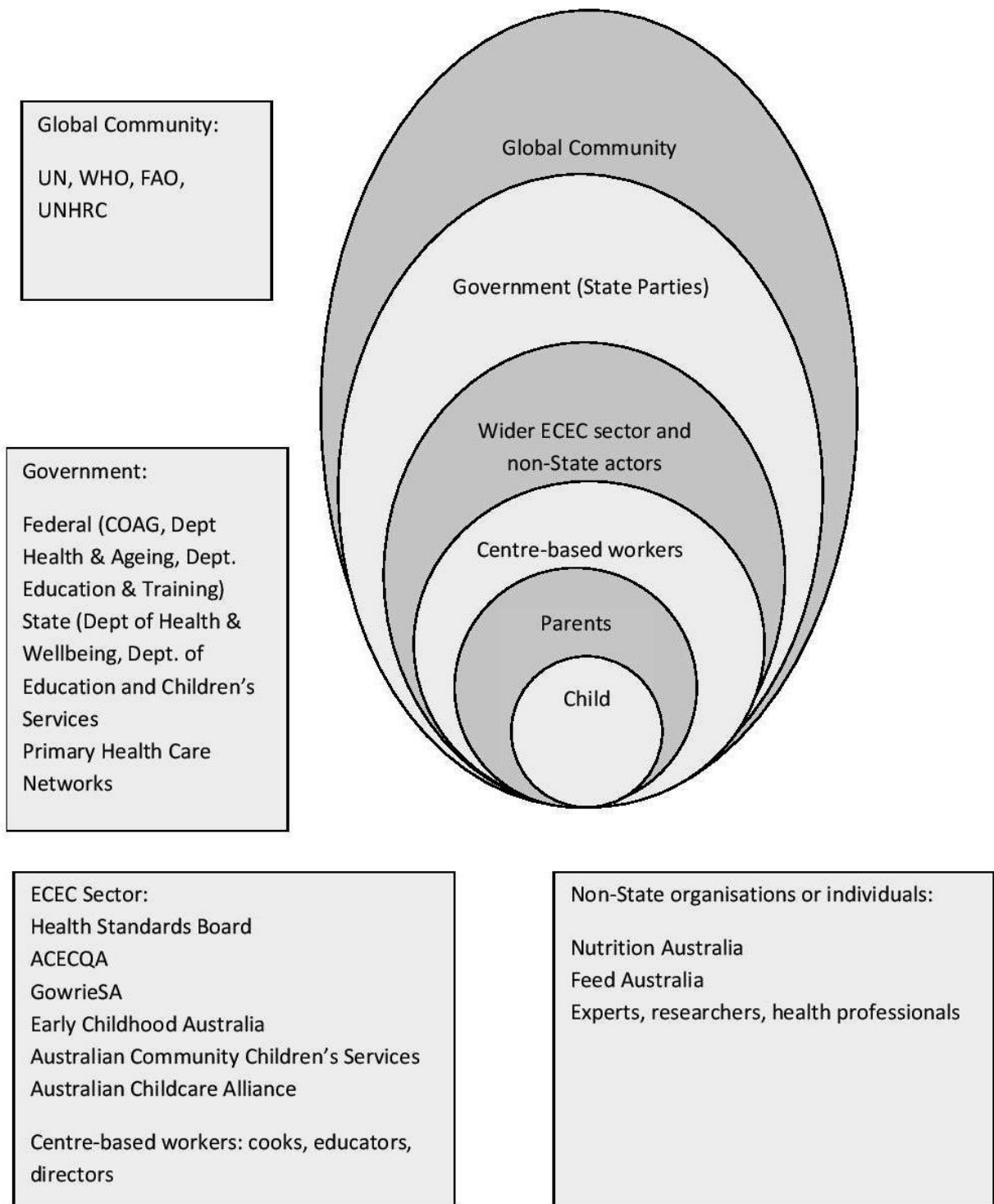
From the umbrella review undertaken as part of this thesis, children's dietary food intake and food choices were significantly influenced by nutrition practices in centre-based childcare (Matwiejczyk et al., 2018). However findings from the empirical studies undertaken in this thesis and recently discussed in Chapter Five, highlight both concerns about the capacity of staff to provide and sustain best practice and an absence of training and education for childcare staff. Personnel in ECEC services partially accept their responsibilities, albeit they are unaware of children's rights with regards to nutrition. They have the motivation and the authority to meet their obligations to the children and parents as rights holders, but as discussed previously in this Chapter, not the resources.

#### 6.3.4.4 Roles and responsibilities of other non-state organisations

Several other non-state organisations that are part of the ECEC sector are obligated to support children's rights to optimal nutrition and are listed in Figure 6-2 using the hierarchy of responsibility proposed by Kent (1994). The layers of responsibility and the list of non-state organisations are derived from the empirical studies undertaken as part of this doctorate using the EMHB. These non-state organisations include ACECQA, the independent national accrediting body which oversees the process, GowrieSA, and the peak professional bodies for the ECEC childcare sector. As part of my studies, influential decision-makers were interviewed (Chapter Five) and those decision-makers from non-state organisations perceived children's rights as fundamental to the ECEC sector but were not aware of their responsibilities as duty-bearers to provide the conditions and services for optimal nutrition. Interviewees were familiar with the sectors' support of children's rights as articulated in the EYLF;

*Early childhood educators guided by the [Early Years Learning] Framework will reinforce in their daily practice the principles laid out in the United Nations Convention on the Rights of the Child (the Convention). The Convention states that all children have the right to an education that lays a foundation for the rest of their lives, maximises their ability, and respects their family, cultural and other identities and languages. The Convention also recognises children's right to play and be active participants in all matters affecting their lives. (EYLF p. 5).*

Non-state organisations are supportive of children's rights and the UNCRC; however, they are not aware of their obligations with regards to nutrition and health and, as such, are likely to lack the resources to act and do not accept their responsibilities with regards to children's right to the conditions and services for optimal nutrition. They have the authority and motivation, albeit their acceptance of responsibility is limited, but not the resources.



**Figure 6-2:** List of duty-bearers using the nested hierarchy of responsibility regarding children's rights to optimal nutrition in centre-based childcare (developed from Kent, 1994)

#### 6.3.4.5 Roles and responsibilities of global duty-bearers

Entities such as the WHO, UNICEF, UN Special Rapporteurs and other international bodies have a responsibility to support national governments by: providing recommendations for action in centre-based childcare to protect children and prevent malnutrition and NCDs; providing leadership in this area; and holding governments to account to meet their obligations (WHO, 2017; WHO, 2016; United Nations General Assembly, 2011; OHCHR, 2015b). The *Global Convention to protect and promote healthy diets in children* (Consumers International & World Obesity Federation, 2015) and the *Report of the Commission on Ending Childhood Obesity* (WHO, 2016; WHO, 2017) acknowledges that State Parties who are signatories of the UNCRC are obligated to provide the conditions for every child to attain the highest attainment of health and that childcare settings are a facilitator for promoting healthy food intake and healthy dietary food patterns in children.

There is growing momentum for a human rights lens to be used to address malnutrition and diet-related NCDs, as seen in the *WHO Global Action Plan for the Prevention and Control of NCDs 2013–2020* (World Health Organization, 2013), the *Rome Declaration on Nutrition* (Food and Agriculture Organization of the United Nations and World Health Organization, 2014), the *Report of the WHO Commission on Ending Childhood Obesity* (World Health Organization, 2016), and the *First Draft Work Programme of the UN Decade of Action on Nutrition 2016–2025* (United Nations, 2017). Global duty-bearers have the motivation, authority and resources, but this influence is not realised in centre-based childcare.

In conclusion, Table 6-2 summarises the role and responsibilities of the key duty-bearers and their capacity to realise children's rights to optimal nutrition in centre-based childcare services. From the CRSA, all of the duty-bearers have the authority to realise children's nutrition rights but lack the motivation or the resources to do this. State Parties are obligated to support childcare services with policy, programmatic solutions, professional development and guidance to meet the best interests of the child and as such are failing children with regards to nutrition.

**Table 6-2:** Roles and responsibilities of key duty bearers and their capacity to realise children’s rights to optimal nutrition and healthy food environments in centre-based childcare, South Australia.

Duty-bearers	Role and Responsibilities	Capacity		
		Motivations <sup>1</sup>	Authority <sup>2</sup>	Resources <sup>3</sup>
Centre-based childcare personnel	<p>Respect, protect and fulfil children’s rights (within capacity)</p> <p>Support the realisation of children’s rights to adequate, nutritious food and a healthy food environment</p> <p>Provide the children with a healthy food environment that supports their development, prevents malnutrition and NCDs and is in their best interests through:</p> <ul style="list-style-type: none"> <li>• Provision of healthy food at the centre</li> <li>• Role modelling healthy food behaviour</li> <li>• Creating positive mealtime environments</li> <li>• Using responsive feeding practices</li> <li>• Including nutrition information and education in the curriculum</li> <li>• Ensuring children’s best interests are considered.</li> </ul>	Partially -fully support children’s rights. But unaware of nutrition-related rights	Yes	No (inadequate)
Non-State organisations	<p>Respect, protect and fulfil children’s rights (within capacity)</p> <p>Support the realisation of children’s rights to adequate, nutritious food and a healthy food environment</p> <p>Support children to claim rights and parents’ role in realising children’s rights to health and a healthy food environment</p> <p>Support centres in achieving healthy nutrition and a healthy food environment through the NQS</p> <p>Advocate for children’s rights</p> <p>Advocate for support for cooks, educators and directors</p> <p>Hold the State to account</p> <p>Provide evidence for monitoring, evaluation and action</p>	Partially -fully support children’s rights. But unaware of nutrition-related rights	Yes	Yes (need to be mobilised)



State Parties	<p>Respect, protect and fulfil children’s rights</p> <p>Develop, implement, monitor and evaluate measures to ensure children in childcare develop in a healthy food environment, including legislation, policies, regulations, programs and promotions</p> <p>Work with ACECQA and regulators to strengthen services and conditions for healthy nutrition and a healthy food environment</p> <p>Support childcare personnel, parents and other non-State actors.</p> <p>Raise awareness of children’s rights with regards to nutrition and advise on how to implement and incorporate them into practice</p> <p>Federal government to provide state government with the means to act.</p>	No	Yes	Yes (need to be mobilised)
Global parties	<p>Support Member States in their responsibility to children regarding nutrition and provide guidance, support and solutions</p> <p>Hold the Australian governments accountable</p>	Yes	Yes	Yes

<sup>1</sup>Does the duty-bearer accept their responsibility?

<sup>2</sup>Does the duty-bearer have the authority to carry out their role?

<sup>3</sup>Does the duty-bearer have the knowledge, skills, organisational, human and material resources?

## 6.4 Discussion

The purpose of this study was to examine to what extent centre-based childcare services support children's rights to optimal nutrition and healthy food environments. Using the CRSA framework, the Articles most relevant to nutrition (Art 24, Art 17, Art 3 (educators not supported), Art 3 (not in best interests of the child) in the UNCRC were at risk of being unfulfilled. According to Tobin (2006) if any provision is unfulfilled then the service is not protecting, promoting or fulfilling children's rights to optimal nutrition and a learning environment that enables healthy eating habits. From the CRSA, it was also clear that there were not enough studies to know whether centre-based childcare supported children with healthy food, an observation made by others (Stacey et al., 2019, Australian Institute Family Studies 2019). From the analysis, three key themes emerged: (1) the UNCRC provisions were articulated strongly in the NQF but were weak with regards to nutrition (2) centre-based childcare had the authority-including parents'-but lacked the resources or responsibility and (3) State Parties have the authority and resources but do not accept the responsibility, despite being primary duty-bearers.

### *ECEC awareness of children's rights to optimal nutrition*

The ECEC sector's philosophy is strongly grounded in the rights of the child, as discussed in Chapter Two, but is not clearly articulated in the NQS which, according to the research findings undertaken as part of my thesis, drives childcare providers' practices. Directors and key decision-makers were aware of children's rights and their responsibilities in general but not with regards to the promotion and provision of healthy food and nutrition from a child rights perspective. In my study focussed on cooks, childcare providers frequently spoke about children's rights to have a choice at mealtimes and about the right to refuse food if they were not hungry, but only some directors mentioned children's rights to healthy food. Key decision-makers clarified that the ECEC sector is committed to children's rights, but the sector is unaware of how nutrition is positioned within this. This view highlights a strong discourse on children's right to respect and agency but a weak discourse with regards to nutrition.

### *Nutrition discourse*

These underdeveloped views about children's entitlements to the fundamental right of healthy nutrition reflect the absence of this discourse in the literature and in ECEC and health policy. As discussed in Chapter Two, children's rights underpin the national legislative framework for the provision of early childhood services, including the *Education and Care Services National Law* (the National Law), the *Education and Care Services National Regulations* (the Regulations) and the *Early Years Learning Framework* (EYLF), all of which explicitly includes provisions from the Convention. Indeed, a joint position paper prepared by the National Children's Commissioner and the Australian Human Rights Commission and Early Childhood Australia affirms the ECEC commitment to the UNCHR with the *Supporting young children's rights: statement of intent 2015-2018* (AHRC & ECA, 2015). However, absent from the findings of the studies undertaken, as part of this thesis, was any reference to these documents from the childcare providers or influential decision-makers that were interviewed.

### *Lack of responsibility and capacity gap*

Centre-based childcare services have the authority but not the resources. Despite childcare providers also being proxy duty-bearers for parents and committed to healthy nutrition, their motivation is equivocal, according to Tobin (2006), because several articles are unfulfilled. As such, they do not fully accept the responsibility.

State Parties have the authority and resources but not the motivation. Governments are obligated to progress the UNCRC provisions and support the centre-based childcare services to provide the conditions and services needed. Ideally, the government would resource the centres to build their capacity to create these conditions and services but, to do this, nutrition must be prioritised in policies (Hill & Trowbridge, 1998; Bellew, Bauman, Kite, Foley, Reece, Thomas, . . . King 2019). Notably, nutrition in childcare settings is not prioritised in federal or SA state plans.

In the next Chapter, to what extent the UNCRC provisions can be utilized to ensure healthy food provision and a positive learning environment for lifelong, healthy eating habits will be

discussed. In this synthesis study, the extent with which centres support children's rights to optimal nutrition was discussed. Further understanding the potential of the UNCRC as a catalyst to improve practice is of significant interest for the benefit of children. In other studies, unrealised provisions have been invoked by public health experts or researchers as a strategy to motivate policymakers and translate provisions into policies, regulations and accountability measures at national, state and local levels (Ferguson, Tarantola, Hoffmann, & Gruskin, 2012; Graheim et al., 2018; Greenway, 2008; Handsley et al., 2014; Mikkelsen et al., 2015; Priest et al., 2010). The next chapter explores the implications of invoking a child rights based-approach and the UNCRC provisions to centre-based childcare.

## 7 Chapter Seven: Discussion

### **Theory to practice: translating nutrition best practice into day-to-day routines**

#### 7.1 Introduction

This chapter discusses and relates the findings from all five studies, undertaken as part of this research, to the literature and theoretical frameworks that were used. The translation of evidence-based recommendations into practice is a universal challenge for researchers, practitioners and policymakers (O'Reilly, 2016). Out of necessity, nutrition-specific guidelines are commonly developed by experts using an understanding of food practices that has been simplified, or informed, by evidence gathered in research conditions where influencing factors are minimised (Chapter Two). In real world settings, which are by nature complex, best practice evidence-based guidelines are not always well translated into day-to-day routines.

To understand this evidence-to-practice gap and the effectiveness of dietary-related interventions in centre-based childcare settings, the first study in my doctorate took the form of an umbrella review (Matwiejczyk, Mehta, Scott, Tonkin, & Coveney, 2018; Chapter Four). Twelve systematic reviews were examined (n=101 primary studies) as to the effectiveness of interventions to promote healthy eating in children aged 2-5 years attending centre-based childcare. A secondary aim was to identify the intervention characteristics associated with promoting healthy eating (Matwiejczyk et al., 2018). This review of systematic reviews (an umbrella review) found that children's dietary food intake and food choices were significantly influenced by healthy eating interventions in childcare, but interventions to prevent obesity did not significantly change anthropometric measures. Characteristics attributed to the success of interventions were strategies that targeted both individual-level and environmental-level determinants and engaged parents. Findings from the umbrella review supported the conundrum of translating evidence-based recommendations into practice. Centre-based childcare was an effective setting for positive changes to children's dietary intake and food choices; however, outcomes were mostly successful if they were led by experts or researchers (Matwiejczyk et al., 2018). Indeed,

results were not replicated when implemented in centres by ECEC careproviders alone and without expert support.

This observation highlighted the need to understand the factors that influence the translation of nutrition best practice developed from the evidence into the real-world of the ECEC sector. Given that quality food provision and the promotion of healthy eating is delivered through structures (i.e. controlled environmental factors, such as having a designated cook) and processes (i.e. the interactions and activities that occur in the centres, especially those between directors and cooks, directors and educators, and directors and parents), qualitative research was employed as the best method for understanding this phenomena. Using the Ecological Model of Health Behaviour (EMHB) as a framework to make sense of the complex and inter-related factors that impact practice, the findings from the three empirical studies (with cooks, directors and decision-makers) discussed in Chapter Five were used to answer the sub-research question: What are the main enablers and barriers to translating evidence-based nutrition-related practices into everyday routines?

From these studies undertaken in this thesis, four areas emerged as both critical drivers and barriers influencing the translation of evidence-based nutrition practices into daily routines: the policy environment; structural factors enabling centres to have control over food provision; factors at the individual-level impeding knowledge transfer; and societal trends, which exerted pressure for change. These four themes are discussed further in the first part of this chapter.

In the second part of this chapter, the application of a child rights-based approach to healthy eating in centre-based childcare and the findings from the Child Rights Situation Analysis (CRSA) presented as a study discussed in Chapter Six, are explored further. In this synthesis study, the results from the three empirical studies, the literature and the umbrella review (Matwiejczyk et al., 2018) were considered. Two themes emerging for discussion in this chapter include the roles and responsibilities of governments as drivers and facilitators for the conditions and services which support children to fulfil their rights, and childcare settings as public health solutions. Before discussing this further, each of the four critical drivers and barriers influencing the translation of evidence based best practice guidelines into nutrition related daily routines will be examined, starting with the policy environment.

## **7.2 The policy-environment**

### **7.2.1 Policy attributes enabling translation**

According to the findings uncovered in the course of this research, the policy environment, driven by the National Quality Standards (NQS), was the most powerful influencing factor (Chapter Five). Introduced in 2012, the NQS provides national benchmarks for seven quality areas important for delivering and achieving quality educational and care outcomes, including the provision and promotion of healthy nutrition (ACECQA, 2018). As such the NQS operationalises the sectors vision to transform the sector to encompass education as well as care from birth to compulsory school age (ACECQA 2018). Made up of 18 standards, achievement of the NQS benchmarks also recognises the importance of children's physical health to achieve educational and care aspirations (ACECQA, 2018; Australian Government Department of Education Employment and Workforce Relations, 2009). Crucial to the implementation of the NQS and its stipulated benchmarks are the childcare providers, who translate the standards and elements of the NQS into day-to-day practices. Application of the EMHB to the findings reported in this thesis corroborates the proposition that childcare providers play a key role in improving children's nutrition, and that they do this by acting as proxies for the interests of many different groups, including children, parents, regulators, ACECQA authorities, and health professionals. Actions by childcare providers impact the food environment, social environment and information environment in accordance with Hawkes et al's (2015) model for change, thus creating conditions for nutrition best practice.

Careproviders' actions were motivated by their beliefs, which aligned with the NQS, including an ideological commitment to its underpinning principles and a sense of being part of a mission to foster healthy eating habits in children. Informing the aspirations of directors and influential decision-makers to enact the NQS, were three underpinning principles specified in the National Quality Framework (NQF), namely that: the rights and best interest of the child are paramount; the role of parents and families is respected and supported; and best practice is expected in the provision of education and care services (ACECQA, 2018). As such, the NQS is a powerful policy with application across Australian ECEC services.

Compared to other countries, the NQS appears to be unique to Australia and characterised by its salutogenic approach. Coined by Antonovsky (1996), a salutogenic approach is one that focuses on factors that support wellbeing and health, rather than having an emphasis on minimising risks or the causes of problems. The NQS is strengths based with aspirational outcomes. As part of the NQF, which is underpinned and shaped by the UNCRC, the NQS is child-centred with children and families central in any decision-making. The holistic, salutogenic approach is reflected in the seven Quality Areas that make up the NQS and this, and the 18 standards, allows for nutrition best practice to be applied to all the environments suggested by Hawkes et al., (2016) for positive change. The NQS also includes a focus on supporting children's lifestyle behaviours with a specific element of a standard that addresses healthy food provision (QA2 Standard 2.1.3). In comparison, research has traditionally focused on what should be eliminated in diets or what should be prescribed for quality and quality, and this reductionist approach is reflected in nutrition specific policies (Swan, Bouwman & Hiddink, 2015). A reductionist approach is not consistent with the strengths based, salutogenic stance taken with the NQS, and this creates tensions when the two intersect.

Another strength of the NQS and NQF is the whole-of-child approach which allows for nutrition to be considered as more than food provision, with nutrition relevant to several other standards. This holistic approach is commendable and has been used in countries such as Japan, France, Sweden and Finland for many years. Termed pedagogical lunches, lunches are coupled with food literacy, nutrition activities in the curriculum, positive role modelling, educators who eat with the children, and informative conversations (Ishida 2018; Moffat & Thrasher 2016; Osowski et al., 2016; Persson Osowski et al., 2013). As such the NQS is inimitable but has its limitations which, with respect to nutrition best practice, were a constraint identified in my studies.

### **7.2.2 Policy attributes constraining translation**

#### *Not fully understood by everyone*

Careproviders experience and understanding of the NQS was not equal for everyone. The introduction of the NQS in 2012 required a paradigm shift with an ideological change



considering nutrition as part of a wider holistic approach, encompassing ‘best practice in the provision of education and care services’ (ACEQA, 2018, p.8), and a salutogenic approach. To direct childcare providers, healthy nutrition is one element of one standard in the NQS relating to a healthy lifestyle (ACECQA 2018). Notably, it requires careproviders to understand how to apply this generalised edict more broadly to all quality areas of childcare practice as part of supporting children with a holistic viewpoint.

#### *Nutrition related element too vague to enforce or measure*

By itself, the element guiding nutrition practice and food provision (QA2 Standard 2.1.3) is too vague to provide direction and inexplicit, so it’s difficult to enforce or measure. In NZ, Gerritsen and colleagues found a similar problem in that most childcare services had a healthy eating policy, but outcomes were constrained by broad policy statements that were not specific enough to be helpful for operationalising (Gerritsen, Dean & Wall, 2017). Moreover, Standard 2.1.3 relates predominately to food provision. While the NQS has the potential to support a whole-of-nutrition approach which includes healthy food provision; positive peer and educator role modelling; responsive feeding practices and eating socialisation at mealtimes that promote healthy eating habits; and food literacy through the curriculum and mealtime conversations, there is no evidence of the impact of this being measured or explored in the literature.

#### *Implicit understanding beyond NQS*

My studies showed that centres implement local healthy eating policies (Matwiejczyk et al., 2007) concurrently with the NQS relating to nutrition. Assisting the application of the local healthy eating policy (HEP) are menu-planning guidelines which were developed individually by each state and territory in the absence of national guidelines (Chapter Two). A scrutiny of these guidelines, reported in Chapter Two, showed that they were not fully consistent across the states (Chapter Two, Table 2-5). Moreover, they were rescinded in SA in 2013 and not replaced. Nevertheless, the study focussing on cooks showed that they preferred food environments shaped by the centre's local healthy eating policy with specific guidelines for menu-planning and food provision (Chapter Five). The relevance of these guidelines was reflected in cooks internalising their understanding of the local HEP and menu planning guidelines and enacting these in their daily routines (Chapter Five). In my studies, childcare

providers had a strong and explicit awareness of the importance of nutrition and wanted to support children with best practice. However, it is assumed that providers have an implicit understanding of nutrition policy and principles that guide practice, derived from knowledge sources over and beyond that specified in the NQS and ECEC policy.

#### *Intersection between nutrition-objectives and NQS policy-objectives*

For the most part, providing healthy food and a learning environment for healthy eating habits while also fulfilling the requirements of the NQS worked well (Chapter Five).

However, sometimes there was discord where the provision of healthy food according to local HEP and menu planning guidelines intersected with fulfilling the broad intent of the NQS. The two policies influencing the translation of evidence into nutrition practice differ in origin and purpose. Best practice consistent with the NQS includes practices which build children's competency to become independent, capable and autonomous individuals with decision-making skills through being able to make choices (ACECQA, 2017). Strategies, including progressive mealtimes, children serving themselves and children making sandwiches, all support children's agency and independence. Managed and monitored by childcare staff, this is based on the assertion that children are successful learners (ACECQA, 2017).

This purpose reflects how the NQS was developed by the early childhood sector supporting the family's wishes with a child-focus and holistic approach. In contrast, local HEP and menu-planning guidelines are non-binding and were developed by experts external to the ECEC sector with a focus on advice about quantities of food to consume based on children's averaged physiological needs. From a nutrition-outcome perspective, it is important to nutrition experts and researchers to follow prescriptive menu-planning guidelines and for children to eat minimum recommended serves from each of the food groups for both quality and quantity (i.e. number of serves and recommended size of serves). From an NQS-outcome perspective offering opportunities for children to learn to eat to appetite and make food choices from the foods provided is important. As a result, the prescriptive edicts of healthy eating policy are reductionist. Notably, while the two paradigms have different objectives, they are nevertheless not mutually exclusive and overlap significantly. However,

they do require an implicit understanding of where nutrition is positioned within the NQS and how to implement nutrition best practice within the ethos of the NQS.

#### *Accommodating cross-setting differences while supporting the role of parents*

Another source of dissonance from the findings in my studies was where the centre staff's mission to provide healthy nutrition, as a duty of care, intersected with perceived differences in the family's expectations about food provision. Directors managed this by being transparent about the food provided and nutrition-related practices of the centre when families enrolled. Consistent with the NQS to focus on supporting families (QA6 Standard 6.1 *Respectful relationships with families are developed and maintained and families are supported with their parenting role*), directors prioritised working with families as being in the best interests of the child (Chapter Five). Meeting the requirements of both a duty of care for healthy food as prescribed by local HEP, and the broader edicts of the NQS to respect families approaches, was dependent upon the directors' skills to engage families in conversations about food, food policy and food-related expectations. It was this relationship of trust with parents that enabled directors to manage situations where the two purposes were discordant.

#### *Comparisons with other countries*

The NQS and ECEC policy environment is unique to Australia. In contrast to other countries (such as the US, Sweden, Finland, and the UK including England, Scotland, Wales and Northern Ireland), Australia does not have national nutrition and food provision guidelines specific to childcare. In these countries, food standards for childcare settings are mostly legislated and encapsulated in policies, with enough detail to provide guidance (Benjamin Neelon et al., 2016; Ishida, 2018; Lucas et al., 2017; Skolverket 2017 cited in Lucas et al., 2017; The Children's Food Trust, 2012). National food standards are easier to enforce because they are legislated, with impacts that are simpler to measure because the guidelines are specific and common across the country. Food provision guidelines are presented as nutrient and food-based standards (Benjamin Neelon et al., 2016; Ishida, 2018; Lucas et al., 2017; Skolverket 2017 cited in Lucas et al., 2017; The Children's Food Trust, 2012), with limits on some foods (for example: limiting puddings or desserts to no more

than one a day) and lists of other foods to be avoided. These foods are high in saturated fat, sugar and salt (such as confectionary and all beverages other than water and plain milk).

Positive dietary outcomes for children have been demonstrated as a result of introducing healthy eating policies in childcare (Benjamin Neelon et al., 2016; Erinosh, Hales, McWilliams, Emunah, & Ward, 2012; Mucavele, Sharp, Wall, Nicholas, 2014), notwithstanding the results have been modest. In one study in UK nurseries results, before and after the introduction of food provision guidelines, reported significant changes in knowledge and confidence, and the inclusion of more food variety in the menu. Changes also included a decrease in foods with added sugar and salt, although the results were self-reported (Mucavele, Sharp, Wall, Nicholas, 2014). Nevertheless, there is limited evidence on the quality of food provided in ECEC settings and no evidence of the impact of healthy eating guidelines on what children eat (Lucas et al., 2017). In Sweden and in Finland, because childcare is universal with free, nutritious meals, uptake and food consumption is not measured.

Results from primary schools are more promising, with the introduction of healthy food standards impacting positively on children's food consumption patterns in several countries including Japan, France, UK, Sweden, Finland and the US (Ishida 2018; Moffat & Thrasher 2016; Lucas et al., 2017; Osowski et al., 2016; Tikkenen, 2009; Taber, Chriqui; Powell, Chaloupka, 2013). Notably, the extension of existing food standards in Sweden in 2011, to also be healthy, had a positive impact on children's diets in preschools (Patterson & Elinder 2015). The evidence suggests that centres in Australia would benefit from national food standards which provide specific guidance and are legislated. It follows that these would be easier to enforce and measure for effectiveness. However, these food standards only relate to food provision and do not support a broader, whole-of-nutrition approach. In some Scandinavian countries the pedagogic lunch is embedded as a tradition in childcare centres and schools, although it is not an official part of policy (Persson Osowski et al., 2013). In France, the mandatory nutritional guidelines for all public institutions serving food is valued less for the food itself and more on teaching children food literacy and healthy eating habits as experiential tools (Moffat & Thrasher 2016). Similarly, in Japan, the Food Education Law has an emphasis on 'nurturing through food' and a focus on food as a positive and

important part of Japanese daily life (Ishida, 2018; Moffat & Thrasher 2016). The NQS offers the potential for a more salutogenic and whole-of-nutrition approach but, with regards to nutrition, is not specific enough.

*Summary; Policy enabling translation*

An objective within this thesis was to answer the research question: ‘to examine the barriers and facilitators to translating evidence-based practice into everyday routines enacted by childcare providers in centre-based childcare services to children aged 2-5 years’. In summary, my findings suggest that the most powerful influencing factor for translation is the policy-driven environment which, in centre-based childcare services, is attributed to the NQS. As such, the NQS drives nutrition-related decision-making, practices, beliefs and systems with the potential to create supportive food, social and information environments. Local HEPs focused on healthy menu-planning complemented policy translation and the achievement of the NQS standard related to nutrition. Where the evidence-to-practice translation of nutrition guidelines were most effective, was when childcare personnel shared an understanding of the principles underpinning the NQS and how nutrition is positioned within this. The paradigm shift attributed to the NQS since its introduction in 2012 means that nutrition is not only about food provision but has a broader contribution to make across all seven quality areas and as part of a holistic and salutogenic approach. This approach supports healthy food provision but also creates positive learning environments for children to develop lifelong healthy food habits. As such, the NQS warrants attention as the policy lever for translating nutrition best practice into daily routines. Essentially the findings from this thesis support what other researchers recognise; that policy is powerful in supporting the translation of evidence into nutrition-related practices and decision-making (Hawkes et al., 2015; Swinburn, 2008; Story et al., 2008).

Limitations of the NQS which constrained policy translation were policy actions relating to nutrition being too broad for operationalisation and an assumption that personnel had an implicit understanding of nutrition directives that would guide practices beyond what was in the NQS. Moreover, there was a further limitation where the two policies (NQS and healthy eating) intersected and were perceived as incongruent. Situations attributed to this incongruence included preferencing outcomes specified by the NQS over fulfilling a duty of

care to support HEP and mitigating cross-setting differences between the home and the centre. As such, the NQS has many advantages but directives supporting nutrition best practice discussed previously appear to be too vague to operationalise, or reliant on an implicit understanding beyond what is specified. This influences the translation of evidence-based nutrition practices into daily routines because policy creates and supports the micro-environments in which individuals fulfil their roles (Colebatch, 2011; Sallis et al., 2008).

## **7.3 Structural factors and the centre-based childcare environment**

### **7.3.1 Structural enablers for translation**

Policy and regulations at the ECEC sector level have the broadest affect by determining the structural supports that need to be provided (Colebatch, 2011). Structural factors, identified in the studies in this thesis, impacting the translation of nutrition best practice included: having a dedicated director with a strong commitment to supporting children nutritionally; a designated cook versed in healthy food provision practices: purpose-built facilities for food preparation and provision: qualified and skilled ECEC personnel; and adequate financial resourcing (Chapter Five). Of these, having a designated cook was imperative for translating nutrition best practice into the provision of healthy food. Cooks provided many positive practices supporting children's nutrition-related health behaviours. Influences attributed to this efficacy were knowledge, skills from workplace experience and training, a common understanding of healthy nutrition and personnel's commitment to supporting children develop healthy eating habits. In the childcare setting, enabling factors included access to menu-planning program frameworks and resources, support from directors and educators and a local healthy eating policy customized to the centre's community (Chapter Five).

Centres which made cooked meals and mid meals prepared by a designated cook, had more control over the provision of healthy food and, according to one Australian study, accepted more responsibility for the nutritional adequacy of the food provided (Cole et al., 2017). Other than in two international studies (Otten et al., 2017; Gerritsen et al., 2017) the value of a cook has not been mentioned, nevertheless several systematic reviews have concluded that healthy food provided by centres, and presumably by cooks, impacts positively on

children's dietary outcomes (Bell & Golley, 2015; Ling, Robbins, & Wen, 2016; Sisson, Krampe, Anundson, & Castle, 2016; Swindle & Phelps, 2018; Wolfenden et al., 2016). However, this association is not seen when the impact of dietary changes on children's anthropometric measurements are measured as outcomes of interventions to reduce obesity (Matwiejczyk et al., 2018; Stacey et al., 2017; Wolfenden et al., 2016). Nevertheless, studies in the USA have reported centre-provided food as healthier compared to food provided in the home setting (Robson et al., 2015). As such, childcare settings with a designated cook provide the conditions which enable the translation of best practice nutrition into healthy meals, which impacts positively on children's dietary outcomes.

Having a designated cook was key to centre's providing healthy food, and this role was possible by having directors who recognised the importance and broader application of nutrition beyond food provision. Organisational characteristics, such as leadership and role specialization are features associated with organisations that successfully implement nutrition best practice (Downs et al., 2011; Farmer, Nikolopoulos, McCargar, Berry, & Mager, 2015). Findings from the studies in this thesis identified directors as instrumental in providing leadership and shaping the organisational culture; a phenomenon supported by Downs et al. (2011). Directors defined the values and norms of the service, and attributed the service's culture to their input, with the ensuing strategies operationalised by cooks and educators (Chapter Five). In addition to leadership, highly formalised assessment and rating processes prompted compliance with the NQS, and this, coupled with role specialization (such as having a designated cooks), can be correlated with the translation of nutrition-related policy into ECEC practices (Downs et al., 2011; Farmer et al., 2015). In addition to the NQS, the formalised regulation processes, the directors' roles and having a designated cook can also be leveraged for translating nutrition best practice into daily routines.

### **7.3.2 Threats constraining structural enablers**

#### *The cook's role beyond scope of practice*

Having a designated cook, and a policy outlining food provision within the centre, is valuable for translating best practice guidelines into daily routines; however, the work undertaken by cooks is under threat, according to the studies undertaken in this thesis. Factors

constraining the translation of nutrition best practice included mounting pressure to modify menus and cook separate meals to manage escalating allergies and accommodate changing family food preferences (Chapter Five). As discussed in Chapter Five, Australia has one of the highest prevalence of food allergies worldwide, with 1 in 10 infants and 1 in 20 school-aged children developing an IgE mediated food allergy (Australasian Society of Clinical Immunology and Allergies (ASCI), 2016; Ierodiakonou et al., 2016). Cultural staple foods, including eggs, dairy, wheat and soy, cause 90% of food allergies. It is not fully understood why children develop food allergies; however, research in the last five years suggests that weaning in early childhood is a critical period (Ierodiakonou et al., 2016). Contrary to earlier recommendations, exposure to common allergy-causing foods, in the first year of life, is an important factor to prevent food allergies (ASCI 2016; Ierodiakonou et al., 2016; Vale et al., 2018). Consensus guidelines advising the timely exposure of egg, peanut and other common allergy-causing foods in the first year of life to prevent food allergy (ASCI, 2016) are at odds with current practices in childcare settings where common allergens are often avoided for all children due to the risk of allergen exposure for the few children with a known food allergy. There is a scarcity of studies investigating this phenomenon in childcare settings but findings from my studies suggest that cooks and educators are not professionally trained in how to adjust meals or menus for food allergies, thereby increasing the risk of an adverse event. Moreover, restrictive menu planning reported in my studies makes it difficult for menus to provide and promote a wide variety of foods, with subsequent risk that children without allergies won't be exposed to foods in a timely way at a sensitive period (Chapter Five).

Allergies pose a risk for the provision of nutritionally adequate and safe foods to children, thereby constraining the translation of evidence-based best practice into day-to-day menu provision. Menu modification for complex diets is outside the scope of cooks' vocational remit and should be developed first and foremost by dietitians and followed up with professional development and supporting resources to cooks. Escalating demands for menu modifications with limited resources, the risk of an adverse event and the risk to children without allergies on a restricted menu, all compromise the cook's position. Allergies are medical conditions and as such dietary management should be supervised by a dietitian or



doctor; cooks and educators are not trained in clinical dietary management and should not be left to modify diets for children with allergies without support.

There is also the fiscal effect of providing a range of different diets to children. In my studies, the food budget was perceived as adequate but when centres experience a threat to service demand, both the food budget and the cook are often deemed expendable. Lucas and colleagues (2017) have also commented that a focus on food safety and foods to avoid is likely to disengage parents with supporting cooked meals (Lucas et al., 2017). This highlights the tension between offering a menu that is safe for most (but not all) children with a wide variety of foods or a menu with less food variety which is inclusive and minimises risk to a few children.

#### *Responsiveness to modern food trends*

From the findings of this thesis, additional barriers were identified including the pressures associated with changing family food preferences and the ability of centres to respond to this. In the literature, it is speculated that changes in the food preferences of families are being transferred to requests for menu modifications for foods consistent with those at home (Cole et al., 2017; Hirsch et al., 2016; Otten et al., 2017). Vegetarianism, avoiding wheat-based foods, consuming dairy-alternatives, and moving towards a more sustainable diet, are dietary trends that are not currently examined in the ECEC literature but data on consumer purchases and preliminary studies suggest a significant change by millennial parents (Hendrie, 2016; Bollani, Bonadonna, & Peira, 2019). Added to this is the increasing diversity in cultures in Australia (ABS, 2018) with varied food customs and food preferences. The transfer of this trend, via parental requests to childcare centres, challenges cooks who are drawing upon limited formal knowledge to adapt menus to reflect modern food trends.

#### *Vulnerability of the cooks' role and risk of being outsourced*

Despite being an enabler for translating evidence-based nutrition practice into everyday routines, the role of the cook is potentially vulnerable as a non-essential, unqualified, mostly sole position with a narrow remit to provide food only. Changing to a packed lunch provided from home could be attractive to centres struggling to meet increasing demands for a varied, culturally appropriate menu that caters for escalating allergies and changing family

food preferences. If left unchallenged, cooks could be outsourced if demands for menu modifications in the absence of system-level support become too difficult.

In the literature, when food is provided from the home to the centre and responsibility is transferred to the parent, children do not receive the same opportunities to develop healthy food habits (Cole et al., 2017). It is the consensus that food provided from home to the centre as packed lunches and mid meals is problematic, with Australian and international studies finding significant amounts of discretionary foods being sent to the centre (Kelly et al., 2010; Johnston, 2013; Nathan et al., 2019; Peterson, 2009; Romeo-Palafox et al., 2015; Sabinsky et al., 2019; Sweitzer et al., 2010). When food is provided from the home it can undermine the gains made in centres to support children with healthy eating (Lucas et al., 2017). In the literature, a reason for why food provided from home is not corrected is because ECEC personnel believe that it is not their remit to tell parents what to pack for their child attending childcare (Dev et al, 2017; Lynch & Batal, 2014; McSweeney et al., 2016; Moore et al., 2005; Sisson et al., 2017). Moreover, ECEC personnel believe that influencing what foods are given to children at home is outside of their agency to change (Dev et al., 2017). Both views reflect cultural norms that children's nutrition is the responsibility of parents and not for public institutions to impose upon (Purcell, 2010; Novak, 2009; Wilson, 2013). Coupled with a lack of supporting policy for a designated cook, as well as nutrition recommendations that include foods provided from outside of the centre, these attitudes make it challenging for childcare providers to support healthy eating habits.

### *Elevating the role of cooks*

As a solution to public health nutrition concerns, elevating the role of cooks and ensuring every childcare centre has a designated cook will go some ways to strengthening the translation of nutrition best practice guidelines into daily routines. At a minimum, specific professional development requirements and nutrition qualifications would elevate a cook's role; however, there are no national requirements for cooks to be qualified in centre-based childcare. As discussed in Chapter Two, some states and territories specify requirements for cooks to be qualified, with SA, Queensland, and Victoria having none. The role of the cook, with specified mandated qualifications, could extend their scope of practice to support

other areas known to influence children's food choices. Cooks are well placed to engage with and support parents in order to foster positive food-related health behaviours for children. Evidence suggests that engaging with parents over recipes, newsletters and healthy menus will impact home practices positively (Ling et al., 2016; Mikkelsen, Husby, Skov, & Perez-Cueto, 2014; Morris et al., 2014; Nixon et al., 2012; Sisson et al., 2016; Ward et al., 2016). Cooks are also skilled at providing hands-on interactive activities with children to increase food literacy and develop a constructive attitude towards food, which in turn impacts positively on food choices (Dazeley & Houston-Price, 2015; Namenek Brouwer & Benjamin Neelon, 2013; Sigman-Grant et al., 2014; Whiteley & Matwiejczyk, 2015; Witt & Dunn, 2012). Children's food choices can also be influenced by initiatives led by cooks where services engage with the local food system to provide food (Bellows, Dufour, Bachmann, Green, & Moore, 2013; Rutz, 2017), thereby increasing children's food literacy with respect to a more sustainable diet (Rutz, 2017).

A barrier to justifying the cook's role as mandatory, is that there is little evidence for the importance of the role or providing food in centres. It is unknown in Australia what proportion of centres are cook-centres and what percentage of a child's daily intake comes from food provided by centres. The most recent national dietary survey did not capture information from very young children (ABS 2019), and the 'Growing Up in Australia' Longitudinal Study (Australian Institute Family Studies 2019) also did not include in its scope the diet of pre-schoolers. In Sweden, where childcare is universal and healthy meals are provided for free, more than 40% of a child's daily energy intake comes from centre-provided food (Osowski et al., 2015). Furthermore, there is limited evidence that the provision of healthy food from centres impacts children's diets and healthy eating habits longitudinally, albeit this is because there are very few studies (Costa et al., 2019). There is a scarcity of research undertaken with centres and this and the absence of monitoring makes it difficult to make any conclusions.

#### *Summary; structural factors affecting translation*

As a result of the limitations of policy, the structural environment in centres does not support nutrition-related practices as well as it could. Structural enablers discussed in Chapter Five included having: a motivated director who determined what would be

operationalised; a designated cook; skilled childcare providers who enacted nutrition best practice across the social, information and food environments; and menu-planning program frameworks and tools. However, a number of factors threaten the sustainability of the structural enablers that are in place, particularly the role of a designated cook which is an extra service offered by centres as goodwill and not part of staff to children ratios or specified in the NQS or NQF.

#### *Threats to the sustainability of nutrition best practice*

The alternative of having food provided from home will undermine any gains made by centres and, from the literature, childcare providers believe that food provided by parents is beyond their influence. Although the role of the cook could be elevated with a broader scope of practice and stipulated qualifications, an absence of monitoring makes it difficult to justify projected outcomes.

Further threatening best practice was the capacity for childcare personnel, particularly cooks, to respond to requests for menu modifications and widening disparities between food provision and practices in the home and in the centre.acerbating this situation cooks were drawing upon limited formal knowledge to adapt menus to reflect modern food trends. If the situation becomes too problematic, it is speculated that the role of the cook is vulnerable to being outsourced. Replacing the role of the cook with packed lunchboxes provided from home, removes the control services have on providing healthy food and contributes to children's poor dietary outcomes (Kelly et al., 2010; Johnston, 2013; Nathan et al., 2019; Peterson, 2009; Romeo-Palafox et al., 2015; Sabinsky et al., 2019; Sweitzer et al., 2010). Moreover, not having a cook adds to parental burden. Food preparation and provision contributes to parents being time-poor, and parental stress impacts opportunities for children to develop healthy eating habits (Bauer et al., 2010; Bekelman et al., 2019; Jastreboff et al., 2018; Storbor-Isser et al., 2013).

#### **7.4 Factors at the individual-level and knowledge transfer**

Childcare personnel need policy and environmental supports but also motivation and education according to the EMHB model (Sallis, Owen, & Fisher, 2008). Moreover, a pre-

requisite for implementing nutrition best practice enabled by policy and structural factors, is having the education which provides the knowledge and skills to do this (Gerritsen, 2016; Wolfenden et al., 2016). Findings from the empirical studies in this thesis, and presented in Chapter Five, demonstrate that childcare personnel have a strong sense of mission and are motivated to support children develop healthy eating habits. Notably, the structural environment offers a designated cook and many enablers for the translation of nutrition best practice; but on the other hand, knowledge transfer through nutrition education opportunities, such as professional learning and training, and the employment of supporting resources, such as menu-planning frameworks and guidelines, are uncertain. Sigman-Grant et al. (2011) and others (Lloyd-Williams, Bristow, Capewell, & Mwatsama, 2011) attribute failing nutrition practices in childcare to insufficient training. Coupled with a lack of current knowledge and efficacy to deal with escalating allergies and changing family food preferences, these were specific concerns expressed in my studies, particularly for cooks (Chapter Five). In contrast, in my studies focused on directors and key ECEC decision-makers, aligning nutrition best practice with the underpinning EYELF and NQS values was more important. My findings therefore suggest that it is critical that training and professional development addresses a shared understanding of the NQS and where nutrition is positioned within this.

#### *Currency of knowledge and professional training*

Currency of knowledge and professional training is imperative for implementing nutrition best practice in childcare settings (Gerristan, 2016; Lloyd-Williams et al., 2011; Sigman-Grant et al., 2011; Wolfenden et al., 2016). There is a paucity of studies researching the effect of nutrition education with childcare personnel in Australia. One study in the state of Queensland showed a significant increase in knowledge of nutrition and physical activity guidelines, and an intention to make changes, following an education program with 765 educators participating in LEAPS between 2013-2016 (Cleland et al., 2018). More evidence is available internationally, where Lanigan (2012) examined the association between careproviders' nutrition-related practices and their knowledge and beliefs in the US. Statistically significant differences as a result of nutrition education led to the conclusion that nutrition training was important for skilling careproviders, particularly around child-feeding and communication with families. An important part of this was addressing

educators' self-efficacy, misconceptions and beliefs. Similarly, in Ireland, a nutrition education intervention resulted in the criterion used to measure best practice doubling in services which participated in the initiative (Johnston-Molloy, Kearney, Hayes, Slattery & Cornish, 2013).

Barriers to providing relevant training in the literature were attributed to a lack of government funding in North America (Sigman-Grant et al., 2011), and a lack of availability of training other than mandatory hygiene and safety in the UK (Lloyd-Williams et al., 2011). In the studies as part of this thesis, workplace training in nutrition was mostly unavailable, unaffordable and inaccessible (Chapter Five). As discussed in Chapter Two, nutrition-related training is mainly available in SA through the Queensland based Nutrition Australia, who offer workshops as a fee-for-service. Adding to the lack of available professional development was the cessation of Federal funding for services provided by GowrieSA, the primary provider of ECEC professional development in SA in 2013. This funding was replaced with monies from the National Inclusion Support Program (Department of Social Services, 2013) which has a different purpose. Admittedly, online menu-planning courses are available to cooks and educators through the Healthy Eating Advisory Service managed through Nutrition Australia (Victoria), and a national online program through *feedAustralia*, managed from NSW. However, uptake in SA of interstate resources appears limited. For example, the *feedAustralia* program is relatively new and not used by any of the 33 centres who participated in my studies. These findings are consistent with an investigation in the US of 336 centres where the barriers identified were cost, accessibility and geographical location (Dipti, et al., 2019). Notably, centres previously participating in funded programs were motivated by licensing requirements. Whereas in the UK and NZ, participation in voluntary nutrition education was mostly by centres already improving the healthiness of their food environments (Gerritsen et al, 2016). These observations suggest that the motivations of childcare providers and the mode of delivering nutrition education need careful consideration.

Additional barriers in my studies were that professional development costs are currently borne by the centre and the individual. The cost and time for professional development competes with other mandatory training priorities such as child protection and child safety,

with individual service operators and individuals entrusted with finding and funding relevant training and education. Furthermore, in South Australia, support from the department responsible for health is limited to 47 Children' Centres for Childhood Development and Parenting, which share a school campus (Chapter Two). In contrast, international governments recognise the importance of centre-based childcare settings and fund nutrition-related training for childcare services as well as food provision, or subsidized food provision for families using childcare (Swindle et al., 2017).

#### *Menu-planning program frameworks and tools*

Also missing for translation of practice were menu-planning program frameworks and tools (Chapter Five). The impact of a successful multi-strategy, capacity-building nutrition incentive scheme (previously mentioned) was enabled by menu planning program frameworks, tools and training (Bell, Hendrie et al., 2015; Golley et al., 2012; Matwiejczyk et al., 2007; Tysoe & Wilson, 2010). Notably, resources developed by the federal government post 2013 to assist centres achieve the NQS relating to healthy nutrition were not used by any of the centres participating in my studies; an observation noted in other international studies where government provided resources were not used (Cole et al., 2017; Ray et al., 2016; Sisson et al., 2017). This observation highlights the value of investigating childcare providers' needs further and tailoring strategies for local needs and conditions (Mayes & Oliver, 2012). Several researchers suggest the use of online programs and applications (apps) as a means of providing education which is low cost and can be used over greater distances (Nathan et al., 2019). Of note is *feedAustralia*, a national online nutritional education initiative that provides ECEC personnel with a free online menu planning tool, integrated with the Federal childcare subsidy system used by each service (Grady et al.; Yoong & Williams, 2015). Initiated in 2017 by the Federal Department of Health, the developers suggest difficulties with the uptake of these resources by the sector (Finch et al., 2019).

Cooks' perceived lack of computer literacy was a factor influencing the uptake of online programs, as shown by the studies in this thesis. Most cooks used computers for searching for recipes but did not have the capacity, including a lack of paid time and confidence, to use online programs (Chapter Five). Professional development preferences have not been

explored very much in the literature. In my studies cooks wanted face-to-face contact where they could engage with other cooks and learn from each other (Chapter Five). This preference was also noted in a cross-sectional survey of directors (n=336) and family childcare home providers (n=1154) across Nebraska, US, although participants identified online delivery also as a suitable option (Dev et al., 2020). The lack of fit between current technology and professional development requirements for centre-based services invites the need for new approaches for delivering nutrition education for childcare personnel, including hard to access educators who work directly with children. Several researchers recommend that professional development be coupled with learning strategies that explore childcare providers' beliefs, as beliefs drive individual actions, and when nutrition education is targeted at changing knowledge alone, there are few significant changes (Hirsch et al., 2016; Lanigan, 2012; Otten et al., 2017; Sisson et al., 2017; Swindle et al., 2017).

The absence of national guidelines is also a barrier to using menu-planning guidelines and program frameworks. As mentioned previously (Chapter Two), each state and territory has responded to the absence of national menu-planning guidelines with their own version for food provision. While these guidelines share a lot in common and are based on the Australian Dietary Guidelines (NHMRC, 2013), an analysis of these reported in Chapter Two revealed a few inconsistencies with recommended serves and serve sizes for food groups. For states such as SA, who do not have current guidelines, drawing upon programs and guidelines opportunistically from different states is confusing when criteria differ.

### *Summary*

The translation of nutrition best practices is dependent upon the skills of childcare personnel when engaging with children and their families, yet targeted professional development and workplace training is missing. At the individual level, affordable access to nutrition-related training and education is urgently required for the transfer of knowledge for translating evidence-into-practice. Gerritsen (2012) explains that without the knowledge and skills to promote healthy nutrition, and without the confidence and belief that what childcare personnel are doing is making a difference, it is unlikely that meaningful improvements will be implemented.



Training not only needs to be available and affordable, but also delivered in a way that is accessible and meaningful. Findings from my research suggest that the increasing use of digital platforms and technologies new to ECEC personnel to increase accessibility, needs careful investigation given its unpopularity with cooks reported in my studies (Chapter Five), and published studies suggesting concerns with uptake of online initiatives (Finch et al., 2019). To be better effective, my findings highlight that professional development consistent with the ideology of the ECEC sector and aligned with the underpinning principles of the EYLF, NQF and NQS will work. Similarly, professional development must include an examination of childcare provider' beliefs, as discussed in Chapter Five and highlighted in other studies (Lanigan, 2012; Swindle et al., 2017). In addition to professional development and training, national evidence-based resources need to supplement the NQS standard relating to nutrition (ACECQA, 2018).

## **7.5 Societal changes impacting translation**

Findings from the studies in this thesis identified that modern food trends impacted the translation of menu-planning best practice into meals. Culturally, food preferences and food trends are continuously changing and require childcare food services to be responsive to this. At the same time, widening disparities between what foods are offered at home and in the centre contribute to behaviours of food refusal and food pickiness, necessitating the need for more consistency between the two environments (Gubbels et al., 2015; Gubbels et al., 2018). Moreover, busy parents struggling with work-life balance (Bauer et al., 2012; Bekelman et al., 2019; Mehta et al., 2019) and time-scarcity (Mehta et al., 2019; Storfel-Isser & Musher-Eizenman, 2013) are more likely to experience a poor diet, which impacts children's behaviours and food preferences. Providing food for children in centre-based childcare relieves some stress from time-scarce parents, while also providing the conditions for children to develop healthy food habits. In some international studies, parents are perceived as appreciative of centres taking on this role (McSweeney et al. 2016). Identifying childcare-based policy and programmatic strategies to reduce parents' work-life stress may have a positive effect on the eating patterns and related health outcomes of children and parents of the NQS. Extending the scope of these strategies may also result in minimising

the differences between these two settings. For example, making healthy food dinner packs available for time-poor parents by some of the centres participating in my studies was positively perceived (Chapter Five). These initiatives from centres provide insights into strategies which go beyond traditional nutrition education workshops, and seem intuitively more engaging for the time-scarce parent. These emerging strategies have relevance for public health interventions as even small amounts of parental engagement, bridging differences between the two settings, are speculated to help prevent obesity in children (Ling et al., 2016; Mikkelsen, Husby, Skov, & Perez-Cueto, 2014; Morris et al., 2014; Nixon et al., 2012; Sisson et al., 2016; Ward et al., 2016).

## **7.6 Enablers and barriers influencing nutrition best practice translation**

Research undertaken in this doctorate with childcare providers identified several factors which influenced the translation of nutrition best practice into daily routines and are not reported elsewhere. By interviewing cooks and directors from centre-based childcare services across SA, and a range of influential decision-makers, insights were provided to answer the research question identifying the main enablers and barriers translating evidence-based, nutrition-related practices into everyday routines. The most powerful enabler came from the policy environment created by the NQS. The NQS drove nutrition-related decision-making, practices, beliefs and systems and generated the potential for influencing the social and information environment, as well as the food environment, known to be necessary for positive practices (Hawkes et al., 2016). By influencing the food, social, information and policy environment, the NQS potentially enables the creation of the conditions and services necessary for children to be provided with foods for optimal nutrition and a positive learning environment for lifelong healthy eating habits.

Underpinned by the UNCRC and principles to provide what is in the best interests of the child, the NQS has a salutogenic approach with a reach across Australia. Augmented with individualised, local healthy eating guidelines (Matwiejczyk et al., 2007), and an element of a standard specific to food provision (NQS QA2 Std 2.1.3), childcare providers were committed to the provision of healthy food. The NQS, in contrast to some countries,

overseas where nutrition guidelines and nutrition standards determine nutrition-related practices and food provision in centre-based childcare (Benjamin Neelon et al., 2016; Ishida, 2018; Lucas et al., 2017; Skolverket 2017 cited in Lucas et al., 2017; The Children's Food Trust, 2012). The unique nature of the NQS however, has its limitations with standards too broad to operationalise; an assumed understanding of nutrition beyond the NQS directives and dissonance when the objectives for healthy eating intersect with the holistic objectives of the NQS and do not align. The weak presence of nutrition in ECEC policies means that nutrition best practice is enacted more from goodwill rather than as a result of policy directives.

Additional enablers for the translation of evidence into practice, not reported elsewhere, included structural factors; particularly directors with beliefs aligned with the NQF and designated cooks. Directors were central to all decisions related to nutrition which cooks, and educators then operationalised. Also crucial were cooks responsible for healthy food provision, thereby giving centres control over what was provided. However, the role of the cook was under threat from demands for menu modifications due to escalating allergies, changing family food preferences, widening cross-setting differences between the home and centre, and an absence of systematic, workplace training. Notably, none of the structural enablers are specified in policy, and are optional. This places the role of the cook at risk of being replaced with food that is provided from home, known to be inconsistent with national dietary guidelines (Kelly et al., 2010; Johnston, 2013; Nathan et al., 2019; Peterson, 2009; Romeo-Palafox et al., 2015; Sabinsky et al., 2019; Sweitzer et al., 2010). Moreover, childcare cooks in my studies and childcare providers in the literature did not believe that it was their role to question what parents provided or to influence what children eat at home (Dev et al, 2017; Lynch & Batal, 2014; McSweeney et al., 2016; Moore et al., 2005; Sisson et al., 2017).

As such, the structural environment in centres does not support nutrition-related practices as well as it could. Additional to this, is that nutrition education and training for childcare providers is mostly unavailable, unaffordable, and inaccessible. System-wide workplace training and nutrition education is a pre-requisite for enabling childcare providers to translate evidence into practice (Gerritsen, 2016; Johnston-Molloy et al., 2013; Wolfenden

et al., 2016). Barriers such as cost, inaccessibility and unavailability has been reported elsewhere (Dev et al., 2020), but unique to the findings in this doctorate are other barriers, such as a lack of computer literacy and competing demands for mandatory professional development.

Ideally, an understanding of the barriers and enablers for translating best practice into daily routines presents opportunities to improve the situation for children by suggesting strategies to mitigate the barriers and gain leverage from the enablers. Before discussing the implications of the findings shared in this thesis, the other research question central to this thesis will be discussed in which a child rights-based approach was used.

## **Enacting children’s rights to healthy nutrition in centre-based childcare**

### **7.7 Introduction**

It has been established in Chapter Two that healthy eating in centre-based childcare can be considered a human right for children using the UNCRC as a framework. This section of the discussion further elaborates on how the provisions within the UNCRC can be leveraged to strengthen the conditions and services needed for children to realise their nutrition-related entitlements. This section also highlights the State’s obligations to respect, protect and fulfil children’s rights to healthy food and learning environments for developing lifelong, healthy eating habits.

The discussion then continues exploring why governments appear to lack the political-will to support public health policy and the healthier environments needed for children to realise their nutrition entitlements in centre-based childcare. The several barriers perpetuating this lack of political-will and preventing State Parties from fully realising their role and responsibilities, are further discussed.

Lastly, two suggestions are made as public health solutions: the use of public health law and establishing centre-based childcare as protected places for children to fully realise their nutrition-related entitlements.

## 7.8 Healthy eating at centre-based childcare as a human right

A focus on centre-based childcare is predicated on the observation that a significant proportion of children are in formal childcare, in response to the societal phenomena of increasing workforce participation by mothers. Figures from OECD countries show, for the first time, that children now spend more time in care away from home than with the family (OECD, 2019). This phenomenon is supported by statistics from Australia showing that the majority of young children will spend significant amounts of time in non-parental childcare (Department of Education & Training, 2018). This societal trend has prompted statements that the childcare setting has replaced the family table as the place for learning lifelong healthy eating habits (Briley & McAllaster, 2011), emphasising the importance of a shared role between parents and childcare. The extensive reach of childcare services to children and their family's makes centres an ideal setting for strategies and practices that provide healthy food and promote the development of lifelong, healthy eating habits. There is an urgency to do this because children have the added requirement of healthy nutrition for growth and development; lifelong healthy eating habits are learnt during this sensitive developmental age; and poor quality diets and childhood obesity are significant public health concerns nationally (Chronic Disease Prevention Directorate, 2017; Department Health & Ageing, 2016; Government of South Australia 2011; NSW Ministry of Health 2013; NT Government, 2015; State of Victoria, 2019).

Viewing unhealthy food provision and malnutrition through a human rights lens is seen in a number of global action plans (Centre Population Health, 2016; WHO, 2016a; WHO, 2016b; WHO, 2017) and published perspectives addressing childhood obesity prevention, unhealthy food marketing directed at children, and the provision of healthy school meals (Ferguson et al., 2016; Granheim et al., 2017; Greenway, 2008; Mikkelsen et al., 2016).

In Chapter Two, food provision and healthy eating in centre-based childcare were explored as a human right using the UNCRC as the child rights-based framework. Four themes were identified using the UNCRC: (1) the ECEC sector recognises the best interest of the child above all other interests; (2) the NQF is underpinned by the UNCRC principles; (3) several provisions in the UNCRC could be invoked to support children's nutrition-related rights for

the highest attainable standard of health; and (4) to realise these rights, supportive environments are needed for the food, social, information and policy environment.

It was put forward in Chapter Two that healthy eating in centre-based childcare could be considered a human right for children. Relevant UNCRC provisions included children's fundamental human right 'to the enjoyment of the highest attainable standard of health' (UNCRC Article 24.1), which in the UNCRC stipulates is 'through the provision of adequate nutritious foods' (UNCRC Article 24.2(c)) to 'combat disease and malnutrition' (UNCRC Article 24.2 (c)). Unhealthy food and malnutrition were increasingly recognised as human rights concerns, since this provision was acknowledged as encompassing malnutrition as both under and over-nourishment, as well as poor quality diets (United Nations General Assembly, 2014a). This interest increased to include settings when the UN Special Rapporteur for Food highlighted the importance of environments to realising health-related human rights (United Nations General Assembly, 2014b).

In the UNCRC there is no mention of centre-based childcare; however, a key principle of the UNCRC is that 'the best interests of the child' is the primary consideration underpinning all decisions about children by all actors (UNCRC Article 3.1). Furthermore, provisions stipulate that assistance must be provided to those caring for children to create the conditions and services needed for children to realise their rights (UNCRC Article 18.2.2). To meet the nutrition-related provision specified in Article 24, State Parties (i.e. governments and associated bodies, such as ministries and the Health Standards Board) are obligated to provide the services and conditions which would enable children to reach their highest level of health through nutrition.

By using the UNCRC as a framework, healthy eating can be considered a human right in centre-based childcare. Several provisions within the UNCRC could be invoked to garner support from policymakers, advocates, and the ECEC sector to respect, protect and fulfil children's rights to healthy food provision and a learning environment for lifelong healthy eating habits. To what extent centre-based childcare already supports children's rights with regards to nutrition is unknown in the literature. A discussion of the findings from the synthesis study, described in Chapter Six addressing this question, is as follows.

## **7.9 The extent of centre-based childcare support for children’s rights to optimal nutrition and healthy food environments**

In Chapter Six, the findings from the three empirical studies undertaken in the childcare setting with cooks, directors and influential decision-makers (discussed in Chapter Five), and the findings from the umbrella review (presented in Chapter Four), were collectively analysed with reference to the literature to answer the research question; to what extent do centre-based childcare services support children’s rights to optimal nutrition and healthy food environments? To answer this question, the Child Rights Situation Analysis (CRSA) framework (Save the Children, 2014; UNICEF Program Division, 2014; UNICEF Division of Policy and Strategy, 2012) was used.

According to the CRSA discussed in Chapter Six, early childhood providers, including cooks, directors and influential decision-makers, have the authority to realise children's rights for optimal nutrition, but not the resources. My findings discussed in Chapter Five showed that childcare services provided many positive practices and from childcare providers’ perspective created the conditions and services needed for children to develop healthy eating habits, such as having a designated cook who perceived their role as providing healthy food. Childcare personnel were also motivated to support the development of healthy eating habits in children with a sense of mission and shared beliefs about the importance of nutrition. These findings were not however as evident in centre-based childcare services reported in other parts of Australia (Cole et al., 2017; Finch, Jones, Yoong, Wiggers, & Wolfenden, 2016; Finch et al., 2019; Jones et al., 2015; Jones et al., 2017; Yoong, Skelton, Jones, & Wolfenden, 2014).

Nonetheless, despite these enablers identified in my studies, the relevant conditions and services needed for children’s nutrition rights to be fully realised, were at risk of not being sustained because of a lack of resources. These resources included a lack of timely professional learning, a lack of system-wide workforce training, and an absence of supporting resources to provide guidance, such as nationally consistent menu-planning program frameworks and tools. These resources are imperative to empower childcare personnel with the skills to respond to the pressures constraining best practice. Societal

changes such as changing food trends and changing parental expectations, escalating allergies and challenges caused by widening cross-setting differences between the home and the centre were demanding of childcare providers. To mitigate these barriers which constrain best practice, systemic, affordable and accessible workforce training and development is urgently needed with strategies to bridge the differences between home and the centre. Key to this is professional development and supporting resources as prerequisites for childcare providers having the skills and confidence to enact practices that support children to realise their rights (Gerritsen et al., 2017; Sigman-Grant et al., 2011). From my research, the absence of necessary resources reflects the weak discourse in ECEC policy and other measures with regards to nutrition. This is epitomised by edicts in the NQS related to nutrition being too broad for operationalising, as discussed in Chapter Five. Adding to this, were issues where the objectives of the NQS intersect with those for healthy eating, which didn't fully align. Sometimes, the salutogenic aspirations of the NQS conflicted with the prescriptive and reductionist best practice recommendations of expert-led healthy eating guidelines, discussed in Chapters Five and Six. Although the two measures overlap extensively. Given that policy drives practice and shapes the environment (Colebatch, 2011), findings from the synthesis study (Chapter Six) highlight how children's rights pertaining to nutrition cannot be realised without supportive environments driven by policy. Strengthening the position of nutrition within the NQS and other ECEC policies is imperative for creating the conditions and services needed for children to realise their nutrition rights.

The NQS is unique to Australia (ACEQA, 2018). In other countries such as the US, UK, Sweden, Finland, Japan and Estonia, there are national standards or guidelines explicit for food provision and nutrition practices in centre-based childcare that drives practice (Benjamin Neelon et al., 2016; Ishida, 2018; Lucas et al., 2017; Skolverket 2017 cited in Lucas et al., 2017; The Children's Food Trust, 2012). A few studies have evaluated the effectiveness of these national guidelines on food provision or on children's dietary outcomes, albeit with moderate impact (Benjamin Neelon et al., 2016; Erinoshio et al., 2012). In Australia, the few intervention studies undertaken using menu-planning guidelines and supporting resources, have also reported positive outcomes (Bell, Hendrie et al., 2015; Golley et al., 2012), demonstrating that specific guidance works. However, as discussed in Chapter Two, each jurisdiction has its own voluntary guidelines which are slightly different



for each state and territory and not applied nationally. There is a lack of evidence to judge whether national food standards would be preferential to developing national, consistent nutrition-related guidelines that, align with and, are integrated within the NQS. An advantage of the NQS compared to national food standards is that they can include policy actions for nutrition beyond just food provision. From my studies, it is also the NQS that drives practices, systems and continuous improvements (Chapter Five).

In summary, centre-based childcare services are committed to supporting children's rights as evidenced by several ECEC policy and directional documents. However, from my studies, and from the literature, centres do not fully realise children's nutrition-related rights because they do not have the resources to provide the conditions and services needed, and do not fully realise their responsibilities to children and parents. Moreover, the provision of enablers such as having a designated cook for providing optimal conditions and services, is through goodwill rather than fulfilling UNCRC obligations or policy directives.

## **7.10 State Parties support for children's rights to optimal nutrition and healthy food environments**

### **7.10.1 State Parties roles at the state and federal policy level**

Central to fulfilling children's rights is the State. As discussed in Chapter Two, State Parties, including the incumbent Parliament, federal and state governments, relevant ministries, government agencies and the regulators (Health Standards Board), are obligated to embed the relevant nutrition-related provisions within legislative and other measures (UNCRC Art. 4). Furthermore, States must ensure that institutions, such as centre-based childcare 'shall conform with standards established by competent authorities particularly in areas of health and safety' (UNCRC Article 3.3). According to the CRSA reported in Chapter Six, State Parties at the state and federal government level, clearly have the authority to enact the UNCRC provisions, and have the resources, but do not have the motivation. As such the State does not fully fulfil their roles and responsibilities according to the tenets of the UNCRC.

The absence of a focus on centre-based childcare as a solution in public health policies, federally and in SA, and a fragmented commitment to focusing on childcare settings in other state and territory plans (Chronic Disease Prevention Directorate, 2017; Department Health & Ageing, 2016; Government of South Australia 2011; NSW Ministry of Health 2013; NT Government, 2015; State of Victoria, 2019), suggests a lack of motivation. Since health promotion was defunded in 2013, new strategies and programs have been absent from national and state public health policies directed at childcare settings (Table 2-1 and Table 2-2, Chapter 2) (Binns et al., 2014; Wutzke et al., 2018). State Parties at the state and federal level of government do not take responsibility for children realising their entitlement to the 'highest attainable standard of health' (UNCRC Article 24.1).

### **7.10.2 State's obligation to support non-state actors**

State Parties are also responsible for supporting the capacity of childcare personnel to enact the services and conditions for children to realise their rights (UNCRC Articles 27.1(3), Art. 3 (3)). According to Jonsson (2003), duty-bearers who do not have full capacity to undertake their obligations are not responsible for this role, with this role defaulting to the primary duty-bearer, which are the State Parties. Given that this is the case, the onus is on the State as the primary duty-bearer with the resources and obligation to support centre-based childcare services (art.18).

### **7.10.3 States are failing**

Tobin (2006) proposes that any decisions which do not address all the provisions within the Convention are equivalent to not respecting the best interests of the child. This view includes not acting to support the provisions. The principle that decisions and actions are made in the best interests of the child (art. 3 (1)) and reflect best practice is fundamental to the ECEC quality framework and, as such, all the provisions would be expected to be fulfilled. Furthermore, the State Parties, by default, must support those who cannot fulfil their obligations (Kent, 1994), and as a duty-bearer with the resources, the State Parties are

primarily responsible for children not realising their fundamental rights for optimal nutrition.

As such, governments are failing to recognise children's human rights to optimal nutrition and to be protected from developing obesity and NCDs. State Parties are not taking responsibility for children's entitlement to the conditions and services necessary for healthy nutrition and a supportive learning environment for developing lifelong, healthy eating habits in centre-based childcare. Like centre-based childcare services, the extent to which governments support children's rights to optimal nutrition and healthy food environments is very limited. Governments have a pivotal role in implementing strong measures, as well as support, for childcare services that respect, protect and fulfil rights related to healthy nutrition. Governments also have the power to develop policy which creates supportive environments. In the next section, it is proposed that current public health policy however is ineffective and is failing our children morally and legally.

## **7.11 Responsibility and failure to realise rights**

### **7.11.1 Public Health policy is ineffectual**

It is of concern that children's entitlements to the conditions and services to fulfil their obligations to respect, protect and promote healthy nutrition are not prominent in centre-based childcare. Childhood obesity and NCDs, in the meantime, continue to rise (Ng et al., 2014; Stanaway et al., 2018), with public health policy and program responses favouring nutrition education activities and personal responsibility for lifestyle modifications (Brownell et al., 2010; Moffat & Stridher 2012; Moffat 2010; Purcell 2010; Roberto et al., 2015).

#### *Private/public divide*

According to Purcell (2010), liberal democratic governments have a belief system characterised by individuals being 'free to choose', for example, what to eat. In return for this autonomy, there is an expectation that people will take personal responsibility for their health and modify their lifestyle appropriately. As such, emphasis is placed on the 'private responsibility' of parents for their children's behaviours (Purcell 2010; Ulijaszek &

McLennan, 2016). The family is considered a private and autonomous institution (Purcell 2010), with parental autonomy sacrosanct. This belief creates the notion of two areas of influence: the private and the public realm. Neo-liberal governments place the onus of responsibility on parents to protect their children's health (Purcell, 2010) and favour the private realm. The belief that nutrition is part of the private realm, and the personal responsibility of families and carers (including childcare providers), preferences individualist strategies such as nutrition education. This is despite the knowledge of environmental factors being a significant contributor to nutritional problems (Sallis & Owen, 2015; Swinburn et al., 2011).

However, nutrition education alone, is known not to work (Brescoll et al., 2008; Roberto et al., 2015; Ulijaszek & McLennan, 2016), particularly for time-poor, working parents (Bauer, Hearst, Escoto, Berge & Neumark-Sztainer, 2012; Jastreboff, Chaplin, Finnie, Savoye & Stults-Kolehmainen, 2018), often targeted with education programs and held responsible for their children's healthy eating habits. An emphasis on personal responsibility and self-management is inappropriate for children who are dependent on adults and very vulnerable (Purcell, 2010). As such, current public health strategies remain ineffective (Purcell 2010).

#### *Reasons for favouring ineffective strategies*

It is argued that governments favour personal responsibility because policy, regulations, and the structural changes needed for a socio-ecological transformation to address obesity and NCDs, is invasive, and intrudes on the private realm of individuals, such as parents (Acker 2008; Barry, Brescoll, Brownell, & Schlesinger, 2009; Purcell, 2010).

In centre-based childcare, this view is held by childcare providers reported in the literature and by cooks interviewed in my studies, with providers reticent to instruct parents on their children's nutrition, or what foods should be provided for childcare (Dev et al, 2017; Lynch & Batal, 2014; McSweeney et al., 2016; Moore et al., 2005; Sisson et al., 2017). Moreover, childcare providers do not believe that it is their role or responsibility to influence nutrition practices in the home (Dev et al, 2017; Lynch & Batal, 2014; McSweeney et al., 2016; Moore et al., 2005; Sisson et al., 2017). These views are held despite childcare providers valuing the importance of nutrition and recognising cross setting differences as problematic, as discussed in Chapter Five.

Whereas parents, interviewed for their perspective about school meal programs in Japan and France, viewed children's nutrition provided by institutions a public issue, and strongly supported government input (Moffat & Thatcher, 2016). This contrasts with the views held by the government and childcare providers described in the literature.

#### *Why government and policymakers favour individualist education policies*

Although individualist health promotion strategies addressing obesity prevention are known to be unsuccessful, Brescoll, Kersh and Brownell (2008) contend that there are several reasons why policymakers favour individualist education policies which perpetuate their use. When assessing the feasibility of US obesity policies, education policies were inexpensive, easier to implement, aligned with traditional American values focused on personal responsibility, and likely to be accepted politically, unlike policy measures such as new regulations. Purcell (2010) claims that policies considered to be the most effective will be the least feasible politically. Indeed, the implementation of the most impactful policies for preventing childhood obesity, according to the evidence (Smith et al., 2019), has been slow. These impactful policies included prohibiting EDNP foods from settings children spend a lot of time in, a tax on sugar-sweetened beverages, and addressing unhealthy food advertising directed at children. Raphael (2015) further attributes education policies to a 'liberal democratic system' privileging business interests and relinquishing power to the food industry, something which Australian childcare services are independent from, in this point of time.

A focus on attributing responsibility to parents and the private realm aligns with the current government's neo-liberal ideology for a 'small government' and a lack of government regulation (Raphael, 2015). The organisation of centre-based childcare as independent, small or medium-sized businesses, which follow business practices, enables this approach to be enacted and gives governments' licence for public health policy with minimal input, consistent with small government ideology (Purcell, 2010).

#### **7.11.2 Public Health is failing our children morally and legally**

A lack of political will to engage in impactful policies results in public health with a minimalist approach (Purcell, 2010). This is seen for the significant proportion of young children attending childcare with the NQS supporting minimalist food provision needs of

children and an absence of national food standards or guidelines for centre-based childcare, other than the generic Australian Dietary Guidelines (NHMRC 2013). Myles and Oliver (2012) attribute the lack of public health policy support to preventative outcomes being difficult to measure. Preventative strategies benefit populations with the outcomes dispersed among the broader population, and take years, if not generations, to measure the impact (Myles & Oliver, 2012). Not only are the results delayed but the benefactors are difficult to identify (Myles & Oliver, 2012; Shill et al., 2012). Myles and Oliver (2012) also concur with Purcell (2010), that public health policy clashes with traditional moral values: that people are personally responsible for changes to lifestyle behaviours.

### *Shifting responsibility to the public sphere*

Beliefs, such as nutrition, are a personal responsibility and a private matter, are a barrier to the development of public health policy resourcing centre-based childcare services. Acker (2008) suggests that the role of liberal, democratic governments in the private realm is changing. Regulatory, policy and environmental changes by governments, that inform and encourage better lifestyle choices, include reduction in tobacco use, immunisation against vaccine-preventable diseases, food-fortification and measures addressing road tolls, alcohol consumption and drug use (CDC, 2011, AIHW, 2018). These are all examples of governments moving beyond influence from the private realm. A criticism of liberalism is that it protects people's freedom from government intrusions, but this prevents interventions on the public's behalf for a healthier future (Acker, 2008). Public health policy which extends beyond education prompts accusations of paternalism, being a nanny state, and social engineering (Novak, 2009; Novak & Brownell, 2012; Wilson, 2013). Governments have a dual role of providing resources and support for public health initiatives while reaffirming people's obligations to their families and the wider community. As Acker (2008) states: 'personal matters are ostentatiously independent of government no longer'. This explanation may explain, in part, why a focus on nutrition in centre-based childcare services is not featured explicitly in policies or legislated, other than food provision and food safety through regulations. Using human rights instruments, such as the UNCRC, is an option to leverage public policy support, as is the increasing use of public health law.

### 7.11.3 Public Health Law

The ten greatest public health achievements in the US in the last decade, were all influenced by law or policy (CDC, 2011), demonstrating its value. This included mechanisms encouraging healthy behaviour through taxation (e.g. tobacco control), legislation (e.g. vaccinations, motor vehicle safety) or policy (newborn screenings, early detection programs), which were also seen in Australia (AIHW 2018). Gostin (2007) describes public health law as:

“.. the study of the legal powers and duties of the state, in collaboration with its partners (e.g. health care, business, the community, the media, and academe), to assure the conditions for people to be healthy (to identify, prevent, and ameliorate risks to health in the population) and the limitations on the power of the state to constrain the autonomy, privacy, liberty, proprietary, or other legally protected interests of individuals for the common good.” (Gostin, 2007, p.1)

This definition clarifies the purpose and potential of public health law but also highlights the tension between the government’s authority, responsibility and duty to protect the population’s health and constraints because of individual liberties (Gostin, 2016), and seen with regards to nutrition as the private/public divide. Nevertheless, law provides the underlying authority for public health to act by impacting health outcomes through changing the physical environment, administering consequences for risky behaviours and altering the information environment (Gostin, 2016; Shrillet al.,2012). By invoking the provisions of the UNCRC, which signatories are bound to through international laws, policymakers and public health experts could be tasked to address the unrealised nutrition rights for children and prioritise actions for childcare settings. This tactic of employing a human rights approach and public health law has been proposed by Granheim and colleagues to accelerate the implementation of the WHO Resolution WHA63.14 (WHO 2010) to restrict unhealthy food and beverage marketing directed at children (Granheim et al., 2019). Although it is too early to judge whether this example will work, meals in hospital have been successfully changed by arguing patients have a basic right to proper nutrition, supported by the Resolution of the Council of Europe on Food and Nutrition Care in

Hospitals (Kondrup, 2004). For strategies invoking human rights provisions, however, it is essential that accountability mechanisms be included.

#### **7.11.4 Responsibility and Accountability**

The main duty-bearer according to the UNCRC is the present parliament and governments responsible for their own actions and for supporting the actions of other duty-bearers. As the main duty-bearer, governments are also responsible for holding other duty-bearers accountable for meeting the obligations listed as provisions in the UNCRC. In accordance with the Right to Adequate Food, General Comments (UN, 1999), accountability requires duty-bearers to have defined responsibilities through legislated standards, such as the NQS; they must be answerable in some way for their conduct with regards to these responsibilities; and they must be subject to penalties or some form of consequences if they do not meet their responsibilities. With regards to nutrition, this would require a number of actions. These would include: the provisions related to nutrition invoked to mobilise action; provisions translated more strongly into supporting local, state and federal policies, regulations, strategies and best practice guidelines; and monitoring and accountability measures to be put into place.

Invoking the UNCRC and relevant provisions would hopefully inspire policymakers, advocates and the ECEC sector to translate what is needed into public health and ECEC policy. A barrier to an effective policy response is liberal beliefs of nutrition being a private matter and the providence of parents and childcare providers. However, some parents may be unaware of the importance of establishing healthy eating habits early, or some busy parents may be unable or unwilling to support their children with healthy eating. By using the UNCRC, and perhaps public health law, responsibility could shift from individuals and being a private matter to the public realm, with a whole-of-system approach. Driving this would be policy actions as a public health strategy positioning centre-based childcare as 'protected places', discussed as follows.



## 7.12 Centre-based childcare as protective places

Throughout this thesis reference has been made to centre-based childcare as ideal settings for providing healthy food and the optimal learning environment for lifelong, protective healthy eating habits. Given that a significant proportion of Australian children spend considerable amounts of time in non-parental childcare during an influential developmental age (Department of Education & Training, 2018), centres have considerable reach to children and their families as a setting which can influence children's healthy eating habits. Although there is a paucity of studies monitoring or evaluating the impact of non-parental childcare on children's food preferences and dietary patterns, results from healthy eating interventions directed at centre-based childcare have highlighted the potential of centres influencing positive dietary outcomes. This influence is attributed to supportive environments and childcare providers who guide children to eat healthily and develop healthy eating habits (Haines et al., 2019; Matwiejczyk et al., 2018). Mechanisms attributed to these outcomes include role modelling, peer role modelling, responsive feeding practices, eating socialisation and other attributes discussed in detail in Chapter Two. As such, centre-based childcare centres have the potential to provide the perfect healthy eating environment with a focus on healthy food provision, the restriction of unhealthy foods, nutrition best practices, and an absence of marketing of NPED foods.

The notion of centre-based childcare being 'protected places' and a public health strategy is novel but has been used for the provision of school meals in schools in several countries (Finnish National Board of Education, 2015; Ishida, 2018; Mikkelsen et al., 2016; Mikkelsen, 2013; Moffat & Thrasher 2016; Mrywawski et al., 2016). In the following section, arguments are presented for centre-based childcare being protective places with reference to cooked, school meal programs in similar countries.

### *School meal programs as an example of protective places*

In Japan, a national subsidised school meal program was developed after the School Lunch Act was enacted nearly 70 years ago (Ishida, 2016; Ishida, 2018). In addition to financial subsidies, nutrition was positioned by law as an educational activity with dietitians employed to manage the provision of school meals and teachers, with dual qualifications in teaching and in dietetics (Diet and Education teachers), were employed to apply a nutrition

lens to education (Ishida, 2018). An additional law, the Local Production for Local Consumption Act, ensured that at least 30% of the food was locally produced thereby supporting local farmers (Moffat & Thrasher, 2016). School meals include three meals (miso soup, rice or bread, meat or fish, vegetables all served separately with a small carton of milk), and served as part of a ritual which acknowledges those who prepared and provided the meal and every child participates in the preparations of serving the meal and cleaning up afterwards (Ishida, 2016; Ishida, 2018). The system-wide approach in Japan is holistic and extends beyond the provision of healthy food (Ishida, 2016; Ishida, 2018).

Similarly, in France, free school meals have been provided for decades, and in 2011 mandatory guidelines ensured that food is health-promoting and locally sourced (Moffat & Thrasher, 2016). Comparable to Japan, school meals are considered as more than the provision of healthy food, and include teachers eating with children and using the mealtime as an opportunity for positive role modelling and conversations to improve food literacy. Also, the school meal program is an important experiential tool in teaching food literacy, and meals are overseen by nutritionists (Moffat & Thrasher, 2016). In France there is a focus on how to eat healthily and recognition that lunch meals as a small part of the total daily diet will not solve obesity concerns however it will educate children to eat healthily for life, which is impactful (Moffat & Thrasher, 2016). The dual mission of provided meals is seen as one of educating and a mission to promote public health (Moffat & Thrasher, 2016).

In Scandinavian countries, free school meal programs and healthy eating national standards extend beyond food provision and include edicts for 'pedagogical lunches' where teachers eat with the children, and eating is seen as an educational opportunity (Ministry of Children, Equality & Social Inclusion 2014; Persson-Osowski, et al., 2013). In these countries, healthy eating is perceived as a human right. Human rights instruments, particularly the UNCRC, are utilised to justify public health laws and national standards for the provision of healthy foods and a whole-of-nutrition, whole-of-nation, approach (Lucas et al., 2017; Ministry of Children, Equality & Social Inclusion 2014).

In Norway, the UNCRC was the catalyst for introducing cooked, healthy school lunches into National Law (Ministry of Children, Equality & Social Inclusion 2014). In Sweden, all new legal provisions are routinely checked against the UNCRC for compatibility (Lucas et al.,

2017). In Norway, Sweden, Finland, Estonia and Japan, national healthy eating standards are written into law and free, or heavily subsidised, healthy school meals are available universally (Ministry of Children, Equality & Social Inclusion 2014; Osowski et al., 2016; Tikkenen et al., 2009; Moffat & Thrasher, 2016; Lucus et al., 2017). Recently in Japan, the parliament passed legislation for all childcare to be provided for free with, free or heavily subsidised, healthy food provided (The Leaders Globe, 2019). Children eat in the classroom and similarly to Scandinavian countries emphasis is placed on using mealtimes and eating as opportunities to educate children about healthy nutrition and food literacy.

### *Effectiveness of school meal programs*

Notably, Japan has one of the lowest obesity rates in the world in children according to the UNICEF *State of the World's Children* report (UNICEF, 2019). In a sample of 41 OECD and European Union countries, 14% of children and adolescents in Japan aged 5-19 years are overweight, compared to 34% in Australia (UNICEF, 2019). Although the school meal program cannot be solely attributed to preventing obesity, Japan employs several purposeful strategies, including this, to support its population and prevent excessive weight gain (Ishida, 2018).

School meal programs do result in positive dietary outcomes, albeit the results are moderate when considered internationally (Langford et al., 2014; Micha et al., 2018; Welker, Lott & Story, 2016). It is acknowledged that lunches are one part of a child's daily total diet and it would be unreasonable to expect school meal programs to make significant changes in anthropometrics. Central to schools being protected places for public health strategies is that school meals are viewed as essential for educating children about healthy eating and food literacy (Moffat & Thrasher, 2016; Ishida, 2018), which can shape eating behaviours and continue into adulthood. Coupled with positive peer role modelling, exposure to quality healthy foods, and mealtimes being a positive experience, exposing children to healthy school meals is viewed as core to children developing lifelong healthy eating habits. Moreover, school meal programs are perceived positively, with parents interviewed in France and Japan grateful to schools for saving families time and effort to make nutritious lunches (Moffat & Thrasher, 2016).

### *Non-parental childcare settings as protective places*

Healthy school meal programs are well accepted traditions and considered an important part of daily life in many countries (Moffat & Thrasher, 2016; Langford et al., 2014; Welker, Lott & Story, 2016). In France, school meal programs are considered to achieve several of the Republic's goals, with the 'mission of educating and the mission of promoting public health' intersecting (Moffat & Thrasher, 2016 p. 140). Teaching healthy eating while providing healthy food, social and informational environments achieves behavioural change (Hoelscher et al., 2013; Moffat & Thrasher, 2016). In the countries referred to in this discussion, a systems-approach is used drawing upon many strategies to support children and not solely a behaviourist, individualist model. Importantly, there is a shift in the issue of poor national diets and childhood obesity being considered a personal responsibility and within the private domain, to being considered a public issue and a government responsibility to change.

These learnings from school meal programs bode well for centre-based childcare settings to become protected places and a public health strategy. In Australia, cooked school meals are not part of the culture, but cooked meals and food provision in centre-based childcare settings is. Moreover, the NQF and NQS provide the framework and mechanism for a systems approach to be taken. The NQF and NQS can ensure supporting food, social and information environments are provided through its policy actions. Moreover, the NQF and NQS is predicated on the principles of the UNCRC which recognises children's entitlements, fosters a holistic approach in partnership with parents, and is the means for realising the intersection between health and education. Core to the NQF and NQS are the best interests of the child and consistent with the rationale of centre-based childcare centres being protected places, which provide the conditions and services necessary for children to realise their nutrition-related entitlements. In the final chapter of this thesis, what is needed for childcare protected places, and the public health implications of my research, are discussed.

### **7.13 Summary**

In summary, there are many enablers which influence the translation of nutrition best practice into daily routines. The most powerful enabler is the NQS. By influencing food, social and information environments the conditions and services needed for children to fully

realise their entitlements, with regards to nutrition, can be created. However, limitations of the NQS constrain the enactment of nutrition best practice and there are several factors, at various levels of influence, which threaten the sustainability of the gains made.

Children's rights cannot be realised without supportive environments directed by policy. In centre-based childcare, the many positive practices, beliefs and shared understandings seen are not embedded within policy and are operationalised out of goodwill. This positions the provision of healthy food as vulnerable to being outsourced, and enablers, such as professional development for nutrition best practice, not being fully supported.

Although the NQF, which drives early education and care services, is clearly underpinned with a commitment to what is in the best interests of the child and best practice, the discourse relating to nutrition is weak. In this thesis, it is postulated that none of the provisions related to nutrition stipulated in the UNCRC are fully realised. To change this, it is imperative that the relevant provisions in the UNCRC be invoked and translated into effective strategies, regulations, policies and accountability measures at all levels: national, state, local, and intergovernmental. Healthy eating should be prioritised with all stakeholders supporting centre-based childcare and decisions weighted towards what is best for children. Centre-based childcare can provide the conditions and services necessary for children to achieve their nutrition related entitlements and would be the ideal setting as a protected place and public health strategy. In the final chapter of this thesis, the implications and significance of my findings will be further discussed for public health policy and planning and concludes with recommendations for future research.

## 8 Chapter Eight: Conclusion

This final chapter concludes my thesis with a brief recount of the answers to my research questions, a discussion on the significance and implications of my studies for public health policy and planning, and an overview of the contribution that this thesis will make to the current body of evidence. The chapter finishes with the limitations of the research undertaken as part of my doctorate, and recommendations for future research.

### 8.1 Recap of research

#### 8.1.1 Context

Chapter Two provided critical background information, exploring centre-based childcare as an ideal setting for young children to develop lifelong, healthy eating habits, and for impacting positively on children's dietary outcomes. In the last three decades, momentous changes to mothers' workforce participation has meant that the majority of very young children in Australia spend significant amounts of time in formal childcare receiving up to two-thirds of their daily nutrition while in care (Department Education & Training 2019). A scrutiny of the literature up to December 2019 in Chapter Two reviewed how childcare practices, and the childcare food environment, can influence children's dietary patterns and presented findings of the most recent work of leading researchers in this area of interest. Researchers concurred that health-promoting environments, such as those in childcare settings, are further impactful with longitudinal studies suggest that healthy eating habits and food choices learnt in health-promoting environments track into adulthood and protect children from developing diet-related non-communicable diseases (Charakida & Deanfield, 2018; Horodyski & Stommel, 2005; Lynch & Smith 2005; Nicklaus et al., 2016; Nicklays et al., 2009; Skinner et al., 2002).

In response to monitoring their populations' health, governments worldwide have identified NCDs as the major public health issue challenging most countries, along with concerns of increasing obesity rates in children and adults (Charakida & Deanfield, 2018; Kyu et al., 2018). Nevertheless, despite the development of evidence-based national dietary guidelines

(NHMRC 2013), considerable government effort (Centre Population Health, 2016; WHO, 2016a; WHO, 2016b; WHO, 2017), and the best intentions of the ECEC sector (ACECQA, 2018), children's diets nationally have not improved; with up to 40% of children's total energy intake from discretionary foods and more than one in five children under four years of age, overweight or obese (Australian Institute Family Studies 2019; ABS 2019; Johnson et al., 2016). Moreover, obesity rates in children are not declining and are a significant risk factor for morbidity and premature mortality in adults (Charakida & Deanfield, 2018).

According to the UN Convention of the Rights of the Child (UNCRC), of which Australia is a signatory, a fundamental right of every child is to enjoy healthy nutrition and the conditions and services that support this. Centre-based childcare is ideally positioned to provide these conditions and services and reach many children. However, in Australia, a substantial proportion of children will not achieve what they are entitled to and will, as adults, bear the burden of diet-related NCDs. Despite considerable public health efforts to promote healthy eating and prevent obesity, obesity prevalence and children's diets are getting worse and, as such, children do not fulfil their rights to the fullest attainment of health.

### **8.1.2 Translation of evidence-based nutrition practices into day-to-day routines**

A proliferation of systematic reviews in the last six years have shown that nutrition-related interventions directed at childcare have a positive impact on children's dietary outcomes (Matwiejczyk et al., 2018) but, when these interventions are not expert or researcher led, they fail to have the same effect (Matwiejczyk et al., 2018). Moreover, positive dietary outcomes achieved in the centre do not transfer across to the home setting or impact on measures for obesity (Stacey et al., 2017; Wolfenden et al., 2016). It seems that, as a society, we are failing to protect our children's health through good nutrition.

The translation of evidence-based best practice into day-to-day routines is a universal problem and is not unique to childcare and nutrition (Reilly, 2006). Moreover, the Australian government, the ECEC sector and childcare personnel have a responsibility to UNCRC to translate nutrition best practice into daily routines. In Chapter Two, several relevant provisions in the UNCRC were identified that could be invoked to support the ECEC sector

and children. However, insights into the barriers and implementation drivers would be needed for the translation of these provisions into strategies and policies.

To understand this evidence-to-practice gap, the following research questions were answered in this thesis:

What are childcare providers' experiences and perceptions of implementing nutrition-related practices in centre-based childcare services with children aged 2-5 years?

What factors influence childcare providers' nutrition-related practices and decisions in centre-based childcare services with children aged 2-5 years?

What are the barriers and facilitators influencing the translation of evidence-based practice into everyday routines enacted by childcare providers in centre-based childcare services with children aged 2-5 years?

Answers to these questions informed the two central questions in this thesis to understand (1) why evidence-based practices are not translated into daily routines and (2) to what extent children's nutrition rights were being fulfilled in centre-based childcare.

To answer these research questions, an umbrella review of 12 systematic reviews (n=101 primary studies) was initially undertaken to examine the effectiveness of interventions to promote healthy eating in children aged 2-5 years attending centre-based childcare and identify successful intervention characteristics (Matwiejczyk et al., 2018, Chapter Four). Findings confirmed what has already been stated: that positive dietary outcome can be achieved but results were mostly facilitated by researchers or external experts and not replicated by childcare personnel unless they received this support. To understand the facilitators and barriers for the translation of expert-led interventions into practice, three qualitative studies were undertaken interviewing centre-based childcare cooks, directors and influential decision-makers for their perspective (Chapter Five).



### 8.1.3 Implementation drivers and barriers

Using the Ecological Model of Health Behaviour (EMHB) as the theoretical framework, findings from the three studies identified key structural factors and other factors which influenced nutrition-related decision-making, some of which have not been reported elsewhere. While the levels of influence identified in my studies were consistent with other levels identified in the literature internationally, these findings reflected additional perspectives from influential decision-makers, cooks and directors not usually included in other studies.

#### *Individual, centre, institutional level influences*

Instrumental at the individual level were the beliefs held by individuals, which were shaped by policy, professional development and past experience. Key roles for nutrition best practice translation were a designated cook and a director committed to a policy ideology encapsulated in a national framework for continuous quality improvement that was developed and driven by the ECEC sector (ACECQA 2018). Directors were important decision-makers and determined the strategies which their cook and educators operationalised.

Also not reported elsewhere were factors at the centre-level of influence. Central to driving an enabling environment for children to experience and learn of healthy food preferences was the National Quality Standards (NQS) and regulatory pressures which, when actioned, impacted the food, social and information environments and the systems underpinning them. This was in accordance with a theory of change model proposed by Hawkes and colleagues of how food-policy works (Hawkes et al., 2015). Complementing the national standard relevant to providing healthy food were locally developed healthy eating policies. Barriers mitigating these positive influencers, however, included: dissonance where the salutogenic and holistic objectives of the NQS intersected with external expert-led nutrition-related objectives; a lack of specificity around the element of standard 2.1.3 (ACECQA, 2018) relating to providing healthy nutrition and; an absence of systemic, ongoing, affordable professional development and knowledge transfer. A lack of menu-planning frameworks and resources, coupled with inconsistent menu-planning guidelines between states and

territories, also presented as barriers to implementation. Furthermore, cross-setting differences between what food the centre provided, and nutrition-related practices enacted at home created further challenges which have been shown to negatively impact on children's dietary outcomes (Gubbels et al., 2015; Gubbels, Stessen al., 2018; Gubbels, Van Kann et al.,2018).

Moreover, escalating allergies and food intolerances, as well as changes in family food preferences, required childcare providers to be skilled in developing responsive menus and know of changing best practice guidelines and trends. The absence of pre-requisite nutrition education as professional development further constrained centres supporting children. For services struggling to resolve these barriers, it will be tempting for centres to direct parents to provide the children's food and to simplify operations. In the literature, this is associated with centre's losing control over what food is provided. Foods being provided from home are not consistent with national dietary guidelines (Kelly et al., 2010; Johnston, 2013, Nathan et al., 2019; Peterson, 2009; Romeo-Palafox et al., 2015; Sabinsky et al., 2019; Sweitzer et al., 2010). Moreover, the policy discourse supporting healthy nutrition practices in the ECEC sector is weak. The positive practices and strong beliefs seen in centre-based childcare are more from goodwill than from policy. It is imperative that childcare services receive support to address these barriers so centres can continue to provide an enabling environment for the development of healthy eating habits in young children.

#### **8.1.4 Fulfilment of children's rights to healthy nutrition**

Children are entitled to the conditions and services needed to promote healthy eating and nutrition (OHCHR, 1989, Article 24). Very young children are especially important as they are at an influential developmental age when healthy eating habits are being shaped for life (Birch & Doub 2014; Ventura & Worby 2013). According to the Child Rights Situation Analysis (CRSA) framework (Save the Children, 2014; UNICEF Program Division, 2014; UNICEF Division of Policy and Strategy, 2012), centre-based childcare services do not meet their obligations according to the UNCRC. A child rights-based approach has not been undertaken in childcare settings before, and the main rights as articulated in Articles 24, 17, and 3 (OHCHR, 1989) are not fully realised. Moreover, a capability analysis as part of this process identified that State Parties, i.e. the government, and childcare services as proxies

for parents (as parents in locum) have a responsibility to ensure that children can fulfil their rights regarding nutrition. If any of the UNCRC provisions are not fulfilled, then none of the provisions are (Tobin, 2006). As such, both the government and the ECEC sector are failing our children.

## **8.2 Implications for public health policy and practice**

According to the UNCRC, the State is the primary duty-bearer and is obligated to support non-State actors (including childcare personnel) realize children's nutrition-related rights (OHCRC 1089). In Australia, provisions within the Convention are accommodated for in the legislated National Quality Framework made up of the Regulations and National Law, and the principles of the UNCRC underpinning the Early Years Learning Framework (EYLF), as discussed in Chapter Two. The discourse in the NQF and associated policies is strong regarding children's rights in general but weak with regards to rights related to nutrition. For State Parties and non-State actors to meet their international and domestic obligations there is a need to change their priorities. There is a pressing need to invoke the unrealised provisions and translate them into policies, regulations and strategies.

### **8.2.1 Policy measures and a call for a policy brief**

Policy is very powerful as it drives decision-making, practices, beliefs and systems with the potential to create supportive environments in which individuals can fulfil their roles (Colebatch, 2011; Esdaile et al., 2019). Protecting our children from obesity and preventable NCDs, as well as promoting lifelong healthy eating habits, must become a political and public health priority to bring about the policy and structural changes needed. By creating this paradigm, children can be re-conceptualised as the responsibility of both the private and public realms. As such, the existing influences of State Parties, non-state actors and families must be strengthened, starting with policies.

Policy from the State is particularly enabling as it provides guidance but also, usually, resources for its enactment. The State, according to the CRSA, has the authority and the resources to fulfil children's rights for optimal nutrition but does not take full responsibility and, therefore, lacks the motivation. This lack of motivation is reflected in an absence of

federal and state policies supporting the conditions and services needed to promote healthy nutrition in children, particularly in childcare where most children spend their time. A shift is needed where responsibly, sitting with the private realm of individual services, moves into the public realm through policy.

Australia has not had a National Nutrition Plan for nearly three decades, despite calls from concerned non-State duty bearers, including the Public Health Association of Australia, the National Heart Foundation of Australia, the Dietitians Association of Australia and Nutrition Australia (FANSIG, 2017; PHAA, 2018). The last National Nutrition Plan (1992), developed before changes in mothers' workforce participation, urgently needs updating and aligning with recommendations from the World Health Organisation (2017), Food and Agriculture Organisation (FAO), and the United Nations Steering Committee on Nutrition (FAO, 2014; Branca et al. 2019).

### ***National nutrition plan***

As a signatory of the UNCRC, member States are obligated to implement a national plan of action for children (OHCHR, 1989). The plan outlines the changes needed for a country to fulfil children's rights as described in the Convention and to state how compliance would be monitored. The ECEC sector regularly reports through the National Children's Commissioner on progress against the UNCRC, albeit not with regards to nutrition or children's health (Australian Human Rights Commission 2015; Australian Human Rights Commission and Early Childhood Australia, 2015; Harcourt, 2013). The WHO Report of the Commission on Ending Childhood Obesity also calls on governments to provide actions to "take leadership...and recognize their moral responsibility in acting on behalf of the child to reduce the risk of obesity" (WHO., 2017, p. vi). The Australian Government has taken a soft approach with policy addressing child-related health concerns by not having a national strategy for addressing childhood obesity and a reliance on professional and consumer groups to advocate for the nation (Barnes, 2010; Jones et al., 2017; Buscermi et al., 2017; Consumers International & World Obesity Federation, 2015; McGuire, 2012). As a priority, Australia needs a national nutrition plan, including a focus on childcare settings. This would be further strengthened by the State reporting key targets to the WHO and the FAO as part of the response to the Rome Declaration (FAO, 2014), the United Nations 'Decade of Nutrition

Action' (United Nations System Standing Committee on Nutrition, 2019), and the WHO Voluntary Global non-communicable disease targets (WHO 2013).

### ***State public health nutrition plan***

Moreover, each state and territory has a public health strategy but these are fragmented with minimal focus on prioritising childcare settings, poor enforcement measures, healthy eating policy which are voluntary and a lack of measures for monitoring and evaluation (Chronic Disease Prevention Directorate, 2017; Department Health & Ageing, 2016; Government of South Australia 2011; NSW Ministry of Health 2013; NT Government, 2015; State of Victoria, 2019). South Australia does not have a state public health strategy since a change in both the state and federal government in 2013. Recently, the *State Public Health Plan 2019-2024* was released but is broad with an absence of actions for nutrition or for childcare settings. The *South Australian Health and Wellbeing Strategy 2019-2024*, which complements the State Public Health Plan, is still in draft form and is focused on treatment and hospital avoidance. As a priority, SA needs a state public health strategy that prioritises promoting healthy nutrition in childcare settings for children.

### ***ECEC policy***

Quality improvement and practices in centre-based childcare are driven by the NQS (Chapter Five, Chapter Six) which is unique to Australia. Children would benefit from the ECEC sector having nutrition more prominent in their policies, a stronger understanding of where nutrition best practice is positioned within the NQS, and a stronger understanding of how nutrition can be enacted across all seven Quality Areas. To strengthen the enactment of nutrition best practice requires the standard related to healthy nutrition (Std 2.1.3) to be supported with stronger policy and with supporting materials that provide more explicit guidance, national menu-planning guidelines, and a position on providing for children with food allergies for centre-based childcare settings. Other standards related to the wider application of nutrition best practice beyond food provision also need the same. The translation of evidence into practice and the implementation of nutrition best practice in childcare settings also require a paradigm shift within health. The NQS is the policy lever for nutrition. Nutrition best practice guidelines developed by external experts separate to the

NQS will struggle to be fully enacted. It is vital that the ECEC sector work in partnership with health to lead and collaboratively strengthen policy directives with common objectives.

In summary, a policy brief is needed at every level of influence, including federal, state, intergovernmental, early education and health. Actions are needed, ranging from prioritising childcare settings as an area of focus in national nutrition plans and policies, to adding a cook qualification in jurisdiction' regulations, and working as a partnership with the ECEC sector and health experts to develop nationally consistent supporting materials for food provision. Gaining political support for a policy brief is challenging (Shrill et al., 2012) with several barriers identified in the previous Chapter. Political will however is essential to progress the changes needed. By invoking the UNCRC provisions relevant to nutrition, policymakers, advocates and the ECEC sector can be mobilised to translate the provisions into the necessary policies. Moreover, the UNCRC highlights the State's obligations to respect, protect and fulfil children's rights to healthy food and learning environments for developing lifelong, healthy eating habits. If the state and federal governments do not act now, they are denying a significant proportion of children their nutrition-related rights.

### **8.2.2 ECEC Sector strategies and call for centres as a protected place**

The ECEC sector and centre-based childcare services have a duty to fulfil children's rights as duty-bearers and as proxies because parents, as secondary right-holders for their children, delegate their role to childcare providers while their child is in care (Kent, 1994). As discussed in Chapter Six, although the ECEC sector has the authority to realise children's nutrition-related rights they lack the resources and only take partial responsibility, which is not enough to be effective. Resources are limited at every level of influence in childcare settings identified in my studies and State Parties, including governments and government-supported centres, have a responsibility to address these barriers and for resourcing these needs. By providing an enabling environment where children can learn healthy food preferences, be provided with healthy food, and develop healthy eating habits, children's nutrition rights can be fulfilled. Additional structural solutions recommended in this thesis and elaborated on in the discussion chapter (Chapter Seven) include:

1. appointing a designated cook in every centre
2. elevating the role of a cook with further qualifications
3. strengthening regulatory frameworks including policies, the NQS and other instruments
4. formalizing a partnership approach with health and the ECEC sector to develop and implement supporting resources
5. exploring new approaches for system-wide professional development
6. engaging with parents differently

These recommendations would ideally be embedded in policy.

### *Centre-based childcare as Protected Places*

Throughout my thesis, the potential for childcare settings to be a public health nutrition solution as a protected place has been supported with findings from my studies and the literature. Evidence from the literature concurs that interventions in childcare centres can impact positively on children's dietary outcomes (Matwiejczyk et al., 2018). Albeit research in this area is scant, food provided by centres that promotes healthy nutrition is indeed healthier than food provided from home (Robson et al., 2015). Furthermore, food provided by centres is considerably more health promoting than packed lunchboxes provided from home (Kelly et al., 2010; Johnston, 2013; Nathan et al., 2019; Peterson, 2009; Romeo-Palafox et al., 2015; Sabinsky et al., 2019; Sweitzer et al., 2010). As protected places, schools in the Scandinavian countries (Lucus et al., 2017; Osowski et al., 2016; Tikkenen et al., 2009; Tikkenen & Uhro 2009), the UK (Evans 2009), Estonia (Ministry of Education & Research of Republic of Estonia, 2007), France (Moffat & Thrasher 2016), and Japan (Ishida, 2016; Ishida, 2018; Moffat & Thrasher 2016) have provided free healthy school meals for years, supported by legislated nutrition standards and laws in some countries.

Notably, Japan has recently introduced free childcare with free or heavily subsidised healthy meals and, according to the UNICEF State of the World Report, is one of the countries with the lowest childhood obesity rates (UNICEF, 2019). This is attributed, in part, to the provision of healthy school meals as part of a whole-of-school approach (Langford et al., 2014) with intentional teaching during classroom mealtimes supporting children to develop lifelong healthy eating habits. In comparison, Australia rates as 28<sup>th</sup> out of 41 countries on

access to nutritious foods for children and ranks as 23<sup>rd</sup> on good health and wellbeing according to a UNICEF report (UNICEF Office of Research, 2017). These international examples highlight how healthy food provision and learning environments for children to develop healthy eating habits are prioritised. In many countries, all children are protected by public health laws which create conditions and environments for children to realise their nutrition related rights. Notably, in Finland, which has one of the highest ratings for access to healthy food and for good health, the school meal is the healthiest daily meal for children (Tikkenen & Urho, 2009).

#### *Protected Places supported by a designated cook*

From my studies, vital to centres becoming a Protected Place is having a designated cook. Equipping cooks with menu planning resources which are flexible and responsive to changing demands, coupled with timely and affordable professional development, increases the capacity of cooks to provide nutrition best practice. In my studies, the remit of the cook was confined to food provision (Chapter Five) but personnel were amenable to extending cooks' and educators' roles further. This might include providing intentional teaching activities, pedagogical lunches and responsive feeding practices known to impact positively on children's dietary outcomes (discussed in Chapter Two). Augmenting this extension in role would be support from experts, particularly where special meals are needed for children with different needs.

#### *Alternative approaches for parental engagement*

Childcare providers are also perfectly positioned to engage with parents with strategies which relieve parental stress exacerbated by food provision decisions and the pressures of maintaining a work-life balance. Those factors are known to impact on children's diets at home (Bauer, Hearst, Escoto, Berge, & Neumark-Sztainer, 2012; Bekelman et al., 2019; Jastreboff et al., 2018; Mehta, Booth, Coveney, & Strazdins, 2019; Storfer-Isser & Musher-Eizenman, 2013), which is speculated to affect children's acceptance of foods in the centre. Cross setting differences in food practices and provision is emerging as a challenge for children (Dev et al., 2017; Gubbels, Gerards, & Kremers, 2015) and there is a need to further resource the sector to mitigate or manage this in partnership with parents.



Centre-based childcare is potentially the perfect setting for public health investment to enable children to develop lifelong, protective healthy eating habits in partnership with parents. Childcare centres have the means to create enabling environments for children to learn healthy eating habits and can mitigate negative influencers by controlling what food is provided as well as skilling educators to provide nutrition best practices. Moreover, centres can involve parents through the information environment, where even small amounts of parental involvement are known to positively influence children's diet (Hesketh & Campbell, 2010; Mikkelsen et al., 2014; Morris et al., 2014; Nixon et al., 2012; Ling et al., 2016; Sisson et al., 2016; Ward, Welker et al., 2016). This can be extended with childcare centres that provide strategies which relieve the burden of parental stress. By providing food for children and innovative strategies that extend into the home, parental stress can be somewhat relieved, thereby indirectly impacting positively on the family's diet.

#### *Partnership engagement*

The advantages of centre-based childcare as settings to support positive dietary outcomes are not exploited enough and as such are underutilised as a potential public health solution. Supporting childcare settings to enact this role requires commitment and resourcing, that governments and the ECEC sector are obligated to provide according to the UNCRC. Ideally, in a world where State Parties and relevant non-state actors consider children's rights and children's nutrition seriously, centre-based childcare settings would be prioritised in public health policies at all levels of government as a solution to protecting children from obesity and adult-onset NCDs. A whole-of-government response is called for (Newman, Ludford, Williams & Herriot, 2016) where centre-based childcare is adequately resourced (with State Parties and non-state actors taking full responsibility for meeting their obligations) according to the UNCRC.

### **8.3 Implications for further research**

Researchers investigating centre-based childcare are also duty-bearers and are responsible for respecting, protecting and fulfilling children's rights to the fullest attainment of health. As such, researchers have a duty to; inform other duty-bearers' decision-making particularly policymakers, program-planners and practitioners; provide baseline information; and monitor and evaluate the situation. Researchers undertaking the latter can hold

governments and other duty-bearers accountable for interventions or best practice. Researchers also have a duty to disseminate their findings for the benefit of the group being investigated and the overall community.

### **8.3.1 Call for translating evidence from trials into routine practices**

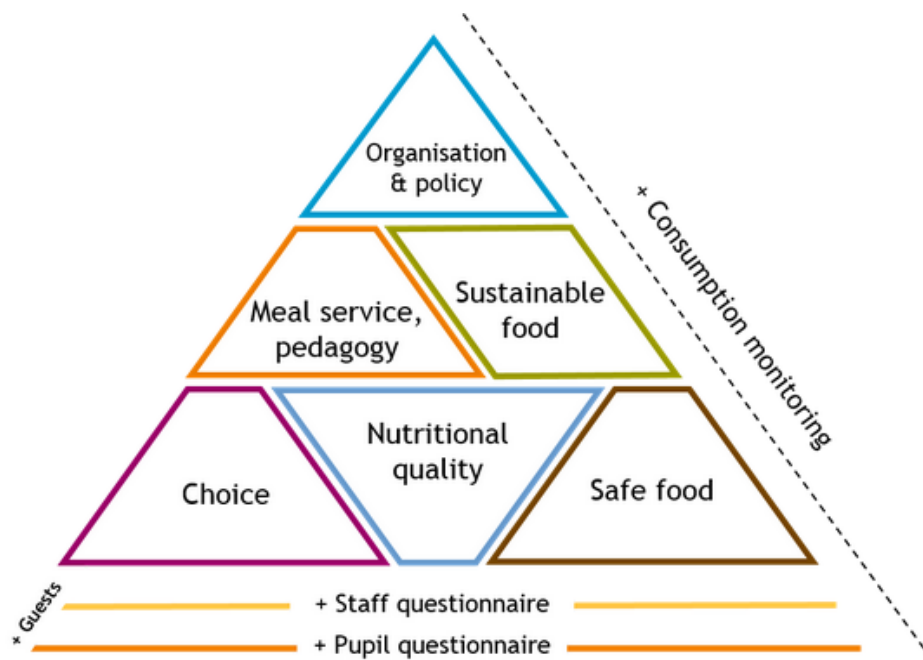
The universal conundrum of translating evidence-based recommendations into practice has prompted researchers in this area of interest to ask for an exploration of factors contributing to this evidence-to-practice gap in childcare. Findings from this thesis identified significant barriers to implementation at each level of influence ranging from an absence of system-level support and training to pressures perceived to be outside of careproviders' agency to change, such as cross-setting differences and changing family food preferences. Findings discussed in Chapter Four, Chapter Five and Chapter Six, highlighted a fragmented, national approach to promoting healthy nutrition in centre-based childcare, with each jurisdiction actioning its own public health plan and menu-planning standards. Moreover, the public health focus is predominately food provision-related, and policies need strengthening to prioritise healthy nutrition in young children. To address the evidence-to-practice gap, it is imperative that the barriers threatening centre-based childcare settings, as a public health solution for healthy nutrition, are addressed and implementation drivers maximised, such as, leverage from the NQS, having designated cooks and system-wide training and professional development.

#### *Building ECEC capacity*

Research needs to extend beyond interventions and trials to building the capacity of the ECEC sector to embed best practice guidelines into daily routines and for practices to be sustained. The online menu planning tool and other strategies implemented as *FeedAustralia* is promising as a national initiative developed as a trial and at the state level (Yoong et al., 2019) and sustaining these practices post-government funding, without external expertise driving it, will be an interesting challenge. In Sweden, where nutrition in ECEC settings is supported with laws and stronger policies, the development of an audit-and-feedback tool also shows promise for affirming and driving nutrition best practices (Lucas et al., 2017).

### *Audit-and-feedback instrument*

The SkolmarSverige instrument (depicted in Figure 8-1) was developed in Sweden following the 2011 law that all preschool and school meals must be nutritious (Lucas et al., 2017). Preschool is available to children from one year of age and 94% of children aged between 3-5 years use this universal service (Mahon, Anttonen, Bergqvist, Brennan & Hobson 2012; Taguma, Litjens & Makowiecki 2013). Compulsory schooling starts at aged six and all preschool meals are provided at no cost, officially since 1997 but many services provided free meals since the 1970s (Lucas et al., 2017). The SkolmarSverige tool has four purposes: to evaluate the impact of the 2011 law; to create a national database of meal quality; to empower preschools and schools to undertake their own monitoring and evaluation; and to provide guidance on where quality improvement is needed (Patterson et al., 2013; SkolmatSverige, 2019). The audit-and-feedback instrument is fully online, free, requires no training, and provides automatic feedback which is tailored to the local context (Lucas et al., 2017; Patterson et al., 2013). The tool is not mandatory and has been utilised by 40% of preschools and schools and usage is increasing (Lucas et al., 2017). There are few studies evaluating the impact of this tool, but one study suggests a significant increase in nutritional quality (Patterson & Elinder 2015). In a study undertaken over a four-week period, improvements were reported for foods meeting iron and fibre requirements (86% and 96% respectively), but fewer schools met requirements for fat and vitamin D (51% and 41% respectively) (Patterson & Elinder, 2015). The strength of this tool is that it incorporates best practice beyond food provision and could be easily adapted for the Australian context and include outcomes from current initiatives, such as *FeedAustralia*.



**Figure 8-1:** The SkolmatSverige instrument and its components (Retrieved from SkolmatSverige, <http://www.skolmatsverige.se/in-english>). Reproduced with permission from Centre for Epidemiology & Community Medicine, Stockholm Country Healthcare Area.

### 8.3.2 Call for a system-thinking study

To position nutrition more strongly in policy and create centre-based childcare as Protected Places, a system-mapping and feasibility study is recommended. Systems-mapping is required to develop a model which will identify stakeholders and strategies to further build the capacity of centres to provide the conditions and services needed for children to fulfil their rights and promote healthy eating to young children and their families. System-mapping (or system-thinking) identifies who in the workforce provides nutrition related practices and decisions, how the workforce receives this, and where the gaps, barriers and opportunities for improving nutrition-related professional development, practices and guidelines are (Carey, Malbon, Joyce, Crammond & Carey, 2015; Joyce, Green, Carey & Malbon, 2018; Littlejohn & Wilson, 2019). Outcomes from system-mapping studies include shaping policies, routine practices, relationships, and values. In Australia, systems thinking has been applied to obesity prevention and the management of NCDs and warrants exploration within the ECEC context (Carey, Malbon, Joyce, Crammond & Carey, 2015; Joyce, Green, Carey & Malbon 2018; Littlejohn & Wilson 2019).

Systems-thinking is different to the approach used in the research undertaken in this doctorate because it can be applied nationally, encompassing more than part of one state and capturing a broad range of relevant national and state-level policies, initiatives and influencers. The approach used here achieved similar outcomes but on a smaller scale and from the bottom up i.e. from participants' perspectives. Nonetheless, application of the CRSA identified key stakeholders, influential decision-makers and end-users that need to be empowered and mobilised into action to support children's nutrition.

Importantly, the ECEC sector needs to advocate for the government to act. As the primary duty-bearer with the additional obligation of supporting the ECEC to assist children realise their rights, governments have a responsibility and a duty to respect, protect and fulfil children's rights to good nutrition. By using systems thinking and prioritising a focus on childcare nutrition through policy, monitoring policy impacts and resourcing strategies as a result of government input, successes could be scaled-up and applied country-wide for all to benefit.

### **8.3.3 Examining modern food trends (including allergies)**

Notably, internationally and in the other states of Australia, there are multi-strategy programs which are supporting childcare settings to provide enabling nutrition environments and supporting professional development (Appendix 10: Current nutrition-related programs supporting centre-based childcare services in Australian states and territories). An area requiring further research includes exploring the impact of escalating food allergies reported in Australia and other countries (Cole et al., 2017; Otten et al., 2017) on childcare providers' capacity to (1) provide appropriate food and (2) the response by childcare services to changing recommendations for preventing food allergies (Australasian Society of Clinical Immunology and Allergies, 2016). At a minimum, guidelines for childcare services on managing food allergies are needed. Similarly, consistent, national menu-planning frameworks and resources, which are flexible enough to accommodate modern food trends (discussed in Chapter Five), need to be developed and led by the ECEC sector and evaluated for effectiveness.

#### **8.3.4 Examining cross-setting differences and multifarious interventions bridging the two settings**

A scarcity of studies exploring families changing food preferences and modern food trends warrants further research to inform policy, menu planning frameworks and tools, and professional development. Another emerging area of research is the effect of work-life pressures on families who use childcare services and the impact of these pressures on children's food preferences and dietary patterns. Furthermore, more research is called for to explore the impact of cross-setting differences in food provision and nutrition-related practices between the home and childcare centres where children's dietary outcomes are affected negatively (Gubbel et al., 2015; Gubbel et al., 2018; Gubbel et al., 2018b; Van de Kolk et al., 2018). Outcomes from these proposed studies could inform interventions which minimise the cross-setting differences and support parents with positive nutrition practices at home.

Surprisingly, there are relatively few studies exploring parental experiences and perceptions of the role of childcare services with providing food and supporting healthy eating habits in their children. Parents are key to providing insights into cross-setting differences and the impact of this on their children and further research with parents is warranted.

#### **8.3.5 Call for monitoring and longitudinal and baseline research**

Missing from the research are longitudinal studies collecting baseline information and measuring the long-term impact of healthy eating habits learnt in childcare. The absence of monitoring and the collection of baseline information precludes studies measuring the effectiveness of childcare on children's diets. International initiatives such as INFORMAS (International Network for Food and Obesity Research, Monitoring and Action Support) aim to address this with a focus on monitoring and benchmarking food environments and policies in private and public organisations. Through public efforts and unifying researchers worldwide to participate, monitoring and benchmarking supports the translation of evidence-based actions into food environments that enable healthy food choices and the promotion of a healthy weight (Sacks, 2019).

Studies are also needed to ascertain what proportion of a child's diet comes from foods provided at childcare. As discussed in the synthesis study in Chapter Six, it is difficult to ascertain the extent to which centres realise children's nutrition-related rights without knowing what nutrition-related practices are enacted in childcare. If the UNCRC provisions are invoked and translated into policies, regulations and strategies it is imperative that this includes monitoring, evaluation and accountability measures.

### **8.3.6 Application in similar settings**

The child rights-based approach and socio-ecological paradigm undertaken in the studies in this research has application for exploring the evidence-to-practice gap in other settings, including family day care, kindergartens, informal childcare settings, primary schools, secondary schools or other settings where children spend significant amounts of time. There is also much learning from this thesis which could be applied to older adults moving into aged care facilities. Notably, in July 2019, the aged care sector adopted an accreditation system very similar to that of the ECEC sector. Although considerable research has been undertaken researching the prevalence and incidence of malnutrition in aged care facilities, there are a paucity of studies internationally and within Australia examining drivers and barriers for the implementation of nutrition best practice, other than a few Australian studies (Matwiejczyk et al., 2018; Matwiejczyk, Farrer, Hamilton & Miller 2018; Miller et al., 2018). At a minimum, qualitative research exploring barriers and drivers for food provision in aged care facilities would be invaluable.

## **8.4 Limitations**

The suite of studies undertaken for this doctorate are unique in that they are the first studies in Australia, and internationally, to explore, in-depth, the implementation barriers and facilitators for the translation of nutrition best practice into daily routines from childcare providers' perspective. It is also the first study internationally to use a child rights-based approach to examine to what extent centre-based childcare settings support

children's rights to nutrition. Inherent in this research were several strategies to ensure rigor but also several limitations.

#### **8.4.1 Methods and rigor**

Findings in my research were specific to individual participants and it is a limitation of qualitative methodology that results are not representational and only transferable to similar contexts or settings (Creswell & Poh, 2017). One of the limitations of my research is that the findings reported here are inimitable to SA which had a history of being supported by the state health department with a multi-strategy, nutrition initiative between 2000 and 2013 reaching nearly 90% of centres (Golley et al., 2012, Matwiejczyk et al., 2007, Tysoe & Wilson, 2010). However, many of the factors described by participants as impacting their decision-making or influencing the food, social and information environment are experienced nationally. For example, all Australian centre-based childcare services work towards achieving the national NQS outcomes, many have a designated cook and cross-setting differences between the centre and home seem to be universal (Gubbel et al., 2015, Gubbel et al., 2018, Gubbel et al., 2018b, Van de Kolk et al., 2018). Similar multi-strategy, nutrition incentive initiatives were also implemented in other states and territories as part of the national approach to preventing obesity in children (Chronic Disease Prevention Directorate, 2017; Department Health & Ageing, 2016; NT Dept. Health, 2015; NSW Ministry of Health 2013; State of Victoria 2019) with the eastern states and Western Australia continuing, albeit with reduced government health department support (Appendix 10: Current nutrition-related programs supporting centre-based childcare services in Australian states and territories).

To counteract this limitation purposeful sampling was used by interviewing a diverse range of roles. Maximum variation sampling was designed to include centres from different contexts (private, not-for-profit, enterprises, newly established, well established) and different communities (low SES, culturally and language diverse backgrounds, geographically diverse). Moreover, different roles were interviewed including roles not explored in other studies (Chow & Humbert, 2011; Lyn, Evers, Davis, Maalouf, & Griffin, 2014; Lynch & Batal,



2011; Otten et al., 2017; Ray et al., 2016). Using maximum variation sampling provided a rich set of experiences from within the centre-based childcare sector. Additional research is therefore warranted to explore whether the findings are consistent with the experiences of childcare providers within other centres in SA and centres interstate with similar policy and regulation contexts.

Another limitation of my research is that using a child rights-based approach ideally requires consultation with all the relevant duty-bearers and right holders. Missing from the studies undertaken were interviews with childcare educators who work in the rooms directly with the children. Some studies have explored educators' views but these have been combined with the views of other childcare roles and have focused on food provision (Dev et al., 2016, Dev et al., 2017; Lynch & Batal, 2011; Otten et al., 2017; Sisson, Smith, & Cheney, 2017; van de Kolk et al., 2018). Educators who work in the rooms with the children are very difficult to access for research. Directors were amenable to cooks being interviewed, and being interviewed themselves, but refused access to educators because legislated staffing ratios require them to be with the children supervising. Interviews after work were also deemed inappropriate, as centres close after 6 pm, and educators have families to return to. After securing ethics approval, 12 centres were approached with an invitation to interview the educators as well as directors and cooks, with different options such as focus groups on site.. Directors' refusal for educators to be interviewed may have been gatekeeping and directors protecting educators time and admittedly qualitative interviews perhaps take longer than completing quantitative surveys. Findings from the directors' interviews, however, affirmed that directors could speak for the educators because directors interacted with educators every day and educators operationalised what directors strategized (Chapter Five).

An important right-holder also not consulted in this research were parents of young children attending centre-based childcare. Surprisingly, there is a paucity of studies investigating parents' perceptions of food provision in childcare settings (McSweeney et al., 2016). Given parents' well-known influence on children's food preferences and behaviours, exploring parents' experience and perceptions of nutrition-related practices, food provision and communication with childcare providers, would fill an evidence gap. Parents' perceptions

would be valuable information to inform the design and development of interventions to minimise cross-setting differences.

The use of grounded theory to inform the analysis of the data collected from cooks, directors and key decision-makers was a strength of this thesis. Grounded theory lends itself to exploring people's lived experience which is influenced by many interacting factors and layers of influence (Braun & Clarke, 2013; Grbich, 2012), typical of the childcare setting. By completing data collection and analysis together and using findings from each group of interviews to inform subsequent interviews, theoretical sensitivity enabled me to develop theoretical insights iteratively and to find new themes (Rupšienė & Pranskuniene, 2010). Also adding rigor to the methods used were strategies to ensure validation (Creswell & Poh, 2017). With my supervisors versed in qualitative research, peer review of the research process was undertaken (Collins & Stockton, 2018; Patton, 2002; Yilmaz, 2013). Reporting rigor was ensured through participant members reading, checking and commenting on their interviews, as done by other researchers (Daly, 2009; Fossey, Harvey, Mcdermott, & Davidson, 2002; Koch, Niesz, & McCarthy, 2014). Theoretical sampling undertaken as part of grounded theory procedures also gave participants an opportunity to comment on findings from previous interviews. To further validate the findings and reduce researcher bias, a reflective diary was kept, and biases, experiences and values declared from the start of the process (Creswell & Poh, 2017). A reflexivity statement is included in Chapter Three with a discussion on the strengths and limitations of qualitative research in general. Lastly, several strategies triangulating the findings were used. This included using multiple and different sources of data (cooks, directors and key decision makers), different theoretical frameworks (EMHB, CRSA) and comparisons between the findings and published literature to corroborate evidence from the findings.

#### **8.4.2 Theoretical frameworks**

Both theoretical frameworks used in my research enabled me to answer the research questions and the following discussion considers the limitations and strengths of using these two models.

### *The Ecological Model of Health Behaviour*

The EMHB provides a framework for understanding multifarious and interacting determinants of health behaviours (Sallis & Owen, 2015). It follows from this, that multilevel studies of determinates will explain behaviours better than studies at one level (Sallis & Owen, 2015). A whole-of-environment approach, typical of the EMHB, has been used extensively for decades in understanding and evaluating population-wide interventions improving tobacco control, healthy eating, physical activity and weight control in diverse settings (Brownell & Warner, 2009; Egger & Swinburn, 1997; Golden & Earp, 2012; Golden, McLeroy, Green, Earp, & Lieberman, 2015; Gubbels, Van Kann, de Vries, Thijs, & Kremers, 2014; Hirsch et al., 2016; Lang, 2009; Lang & Rayner, 2012; Lynch & Batal, 2011; McLeroy, Bibeau, Steckler, & Glanz, 1988; Sallis et al., 2006). As such, the EMHB also lent itself to being used in examining nutrition in centre-based childcare settings.

The EMHB helped make sense of muddled, multifarious real-world decisions by making the roles and relationships between actors explicit. By doing this, the EMHB framework enabled the phenomena of interest addressed in this doctorate to be conceptualised (see Table 6-1, Chapter Six) and analysed (Hirsch et al., 2016). The EMHB framework was therefore ideal for studying healthy eating practices and environments in the childcare setting. As one of many social ecological models, the EMHB provided a perspective that allowed an understanding of complex nutrition practices in childcare by (1) identifying influencing factors and levels of influence and (2) examining implementation drivers and barriers for translating nutrition best practice into everyday routines according to cooks, directors and key decision-makers.

As well as enabling the conceptualisation of multiple factors of nutrition-related behaviours as levels of influence, the EMHB provided me with a framework to describe the determinants of healthy eating when reviewing the literature (Chapter Two); to organise the coding and findings into levels of influence (Chapter Five); and to compare findings with other studies in the literature which used similar frameworks. Moreover, the EMHB framework was broad enough to support other models, such as Hawkes and colleagues' (Hawkes et al., 2015) model for change and the Child Rights Situation Analysis framework (Dixon, 2014) used in my studies. In Australia, a similar model used is the Transtheoretical

Domain Framework which was tested using data from the studies reported in Chapter Five and is described in the methodology and methods chapter. As such the EMHB was better for the purposes of the studies undertaken as part of this doctorate.

A limitation of using the EMHB is the assumption that each level of influence is of equal importance (Sallis & Owen, 2015). This tenet precludes knowing which of the implementation drivers or barriers or which level of influence is the most influential (Sallis & Owen, 2015). Also, multilevel interventions which are an outcome of using an EMHB approach need years to work, particularly those targeted at policy and environmental changes (Sallis & Owen, 2015) and, therefore, an evaluation of the worth of using the EMHB model requires long-term resourcing.

#### *The Child Rights Situation Analysis*

A child rights-based approach has been used for researching the extent with which children's rights are fulfilled since the UNCRC was introduced in the 1990's (Australian Human Rights Commission 2015; Beracochea, Evans, & Weinstein, 2011; Doek, 2010; Ferguson, Tarantola, Hoffmann, & Gruskin, 2016; Goldhagen, 2003; Hunt, 2009; Ingleby et al., 2008; Sigman, 2010; Velardo & Drummond, 2017). The Convention provides a framework for public health policy and practice to improve the capacity of duty-bearers to realize children's rights and has been used to explore obesity prevention and food advertising directed at children (Handsley et al., 2014; Priest et al., 2010; Swinburn et al., 2008;) and healthy school meals in Europe (Mikkelsen et al., 2016).

Unique to this doctorate is the use of the data and findings from three empirical studies (Chapter Five) to inform the use of the Child Rights Situation Analysis described as a synthesis study in Chapter Six. The application of a child rights-based approach forces the researcher to consider all roles responsible for fulfilling children's rights and the duty-bearers capacity according to three constructs: motivation, authority and resources (Dixon, 2014). This approach made the governments' and childcare sectors' obligations explicit. Analysing the situation within the whole context of the Convention also provided a broader and fuller understanding of the issue and an understanding of the capacity of the childcare sector in providing the conditions and services needed for children to fulfil their nutrition

rights. Gains were strengthened through this process by using both the EMHB and the CRSA frameworks. Triangulating the findings from using the two theoretical models also added validity to the process and enabled the generation of meaningful solutions across different levels of influence.

Lastly, children (aged two-five years), who are a significant right-holder, were not interviewed. It is debatable whether the children would be old enough to interview as discussed by several early childhood scholars (Cornish, 2012; Harcourt, 2013; Kennedy & Barblett, 2010; Priest et al., 2010) and unlikely to receive ethics approval. Nevertheless, children's voices are a very important part of child rights-based approaches.

Overall, the methodology, theoretical frameworks and methods used met the purposes of this doctorate well and enabled the research questions to be answered. Every effort was made to mitigate potential limitations described in the methods chapter within the inherent constraints of qualitative research, including inevitably my role as a researcher and my perspective discussed in Chapter Three.

## **8.5 Conclusion**

Society is judged by how well it supports its most vulnerable, particularly the very young. Under the UNCRC, children have a right to optimal nutrition, the conditions and services that support this and the prevention of NCDs. An increasing and substantial proportion of young children in Australia and world-wide are gaining excessive weight and will eventually bear the burden of preventable diet-related non-communicable diseases. Therefore, children do not fully enjoy their rights to the fullest attainment of health. Preventing non-communicable diseases is a global and national priority requiring urgent action (Consumers International & World Obesity Federation, 2014; WHO, 2013; World Health Organization, 2017).

What children eat, their food preferences and nutrition-related behaviours are shaped by multifarious factors including the environment they live in and the influence of those around them. With societal changes in mothers' workforce participation, centre-based

childcare is now an influential setting with many children receiving up to two thirds of their daily nutrition during a crucial developmental age in care. As such, centre-based childcare services are powerful settings for children to develop lifelong healthy eating habits protected from the factors in our environment that mitigate this happening.

According to the UNCRC, governments have a responsibility to respect, protect and support children to fulfil their rights to health; however, to move forward and achieve this, requires governments to have the will to act. It appears that government has the authority and the resources to elicit positive dietary changes at the national, state and local level but not the motivation. Moreover, governments are obligated to support non-State organisations and entities, such as centre-based childcare services and ECEC personnel to support children to fulfil their rights. Centre-based childcare services and the ECEC sector have the authority to provide the conditions and services for children to attain their potential for health, but do not take full responsibility for this and lack the resources.

Systematic reviews provide evidence that centre-based childcare services can impact children's dietary outcomes positively and that childcare settings can be leveraged to have a positive influence on children (Matwiejczyk et al., 2018). Findings from this research have identified many implementation drivers; however, barriers to the translation of nutrition best practice into everyday routines threaten the sustainability of these positive practices. To strengthen and maintain these positive outcomes, a focus on childcare settings must be prioritised. It is imperative that centre-based childcare be resourced and supported with policies that are the catalyst for enabling strategies at every level of influence. Policy is the means to also define centre-based childcare as Protected Places for progressing children's healthy eating habits in partnership with parents.

The government, as the primary duty-bearer, is legally obligated internationally to employ all measures to respect, protect and fulfil children's rights. Moreover, governments are obliged to support childcare centres to provide the conditions and services which will give young children every opportunity to attain optimal nutrition and to be protected from developing non-communicable diseases. Not to do this is failing our children. Inaction and missed opportunities perpetuate harm, widens inequities and denies children their entitlement to develop and fulfil their potential to live healthy lives.

## 9 References

- Abarca-Gómez L, Abdeen ZA, Hamid ZA, et al. Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128· 9 million children, adolescents, and adults. *The Lancet* 2017; 390: 2627–2642.
- Abdullah, A., Wolfe, R., Mannan, H., Stoelwinder, J. U., Stevenson, C., & Peeters, A. (2012). Epidemiologic merit of obese-years, the combination of degree and duration of obesity. *Am J Epidemiol*, 176(2), 99-107. doi: 10.1093/aje/kwr522.
- ABS. (1996). *National Health Survey: First Results, 1995*. Canberra: ABS.  
<https://www.abs.gov.au/ausstats/abs@.nsf/cat/4392.0>
- ABS. (2014). *Australian Health Survey: First Results, 2011-12* Canberra: ABS.  
<https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.001main+features12011-12>
- ACECQA Australian Children's Education Care Quality Authority. (2018). *Guide to the National Quality Framework (Updated October 2018)*. Sydney Australia  
[https://www.acecqa.gov.au/sites/default/files/2020-01/Guide-to-the-NQF\\_2.pdf](https://www.acecqa.gov.au/sites/default/files/2020-01/Guide-to-the-NQF_2.pdf)
- Acker, E. V. (2008). Diets, exercise and love: how far can governments go? doi:  
<http://apo.org.au/node/6050>
- Adamson, P. (2008). The child care transition: A league table of early childhood education and care in economically advanced countries. *Papers inreca 08/20, Innocenti Report Card*.
- Adler, N. E., & Stewart, J. (2009). Reducing obesity: motivating action while not blaming the victim. *Milbank Q*, 87(1), 49-70. doi: 10.1111/j.1468-0009.2009.00547.x
- Ahern, S. M., Caton, S. J., Blundell-Birtill, P., & Hetherington, M. M. (2019). The effects of repeated exposure and variety on vegetable intake in pre-school children. *Appetite*, 132, 37-43. doi: <https://doi.org/10.1016/j.appet.2018.10.001>.
- AIHW. (2018). *Australia's Health 2018* Chapter 4 Diet, Australia's health series no. 16. AUS 221. Canberra: AIHW.
- AIHW. (2018b). *Nutrition across the life stages*. Cat. no. PHE 227. Canberra: AIHW.
- AIHW. (2020). *Australia's children*. Cat. no. CWS 69. Canberra: AIHW.
- Alberdi, G.; McNamara, A.E.; Lindsay, K.L.; Scully, H.A.; Horan, M.H.; Gibney, E.R.; McAuliffe, F.M. (2016) The association between childcare and risk of childhood overweight and obesity in children aged 5 years and under: A systematic review. *Eur. J. Pediatr.* 175: 1277–1294.
- Allirot, X., da Quinta, N., Chokupermal, K., & Urdaneta, E. (2016). Involving children in cooking activities: A potential strategy for directing food choices toward novel foods containing vegetables. *Appetite*, 103, 275-285. doi: 10.1016/j.appet.2016.04.031.

- American Academy of Paediatrics. (2011). *Caring for our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs*. Washington, DC: American Academy of Pediatrics.
- Antonovsky, A. (1996). The salutogenic model as a theory to guide health promotion. *Health Promotion International*, 11(1), 11-1.
- Aromataris, E., Fernandez, R., Godfrey, C., . . . P. (2015). Summarizing systematic reviews: methodological development, conduct and reporting of an Umbrella review approach. *Int J Evid Based Healthc.*, 13(3), 132-140.
- Aliyu, A. A., Bello, M. U., Kasim, R., & Martin, D. (2014). Positivist and non-positivist paradigm in social science research: Conflicting paradigms or perfect partners. *J. Mgmt. & Sustainability*, 4, 79.
- Alvaro, C., L. A. Jackson, S. Kirk, T. L. McHugh, J. Hughes, A. Chircop and R. F. Lyons (2011). Moving Canadian governmental policies beyond a focus on individual lifestyle: some insights from complexity and critical theories. *Health Promot Int* 26(1): 91-99.
- Attorney-Generals Department. (n.d.). *Right to Health Public Sector Guidance Sheets*. Canberra: Attorney-General's Department Australian Government. <https://www.ag.gov.au/RightsAndProtections/HumanRights/Human-rights-scrutiny/PublicSectorGuidanceSheets/Pages/Righttohealth.aspx>.
- Australasian Society of Clinical Immunology and Allergies. (2016). *ASCI Guidelines Infant Feeding and Allergy Prevention* <https://www.allergy.org.au/hp/papers/infant-feeding-and-allergy-prevention>.
- Australian Bureau of Statistics (2015). *4364.0.55.0001 National Health Survey First Results 2014-2015*. Commonwealth Government of Australia.
- Australian Bureau of Statistics. (2017). *2071.0 - Census of Population and Housing: Reflecting Australia - Stories from the Census 2016*. <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2071.0~2016~Main%20Features~Cultural%20Diversity%20Data%20Summary~30>.
- Australian Bureau Statistics. (2018). *2033.0.55.001 Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA) Australia, 2016*. Canberra.
- Australian Children's Education and Care Quality Authority (ACEQA). (2018). *Revised National Quality Standards*. Australia.
- Australian Government Department of Education. (2019). *Child Care Package*. <https://www.education.gov.au/new-child-care-package-information-resources-families>.
- Australian Government Department of Education Employment and Workforce Relations. (2009). *Belonging, Being and Becoming: the Early Years Learning Framework for Australia* Canberra: Commonwealth of Australia.: Retrieved from [https://www.acecqa.gov.au/sites/default/files/2018-02/belonging\\_being\\_and\\_becoming\\_the\\_early\\_years\\_learning\\_framework\\_for\\_australia.pdf](https://www.acecqa.gov.au/sites/default/files/2018-02/belonging_being_and_becoming_the_early_years_learning_framework_for_australia.pdf)



- Australian Human Rights Commission and Early Childhood Australia (ECA). (2015). *Supporting young children's rights: Statement of intent (2015–2018)*. Australia  
[https://www.humanrights.gov.au/sites/default/files/supporting\\_young\\_children\\_rights.pdf](https://www.humanrights.gov.au/sites/default/files/supporting_young_children_rights.pdf)
- Australian Institute Family Studies. (2013). *Growing Up in Australia: The Longitudinal Study of Australian Children* (LSAC) The Longitudinal Study of Australian Children Annual Report 2011-2012.
- Australian Institute Family Studies. (2019). *Growing Up in Australia: The Longitudinal Study of Australian Children* (LSAC) Annual Statistical Report 2018  
<https://growingupinaustralia.gov.au/research-findings/annual-statistical-reports-2018>
- Australian Institute of Health and Welfare. (2014). *Australia's health 2014*. Australia's health series no. 14. Cat. no. AUS 178. Canberra: AIHW.
- Australian Medical Association. (2016). *AMA Position Statement on Obesity*.  
<https://ama.com.au/position-statement/obesity-2016>.
- Australian National Preventive Health Agency (Abolition) Act. (2014).  
[http://www.aph.gov.au/Parliamentary\\_Business/Bills\\_Legislation/Bills\\_Search\\_Results/Result?bld=r5203](http://www.aph.gov.au/Parliamentary_Business/Bills_Legislation/Bills_Search_Results/Result?bld=r5203).
- Ball, S. C., S. E. Benjamin and D. S. Ward. (2008). Dietary Intakes in North Carolina Child-Care Centers: Are Children Meeting Current Recommendations? *Journal of the American Dietetic Association* 108(4): 718-721.
- Bandura, A. (2004). Health Promotion by Social Cognitive Means. *Health Education & Behavior*, 31(2), 143-164. doi: 10.1177/1090198104263660
- Baranowski, T., Cerin, E. & Baranowski, J. (2009). Steps in the design, development and formative evaluation of obesity prevention-related behavior change trials. *Int J Behav Nutr Phys Act* 6, 6. <https://doi.org/10.1186/1479-5868-6-6>
- Baugh Littlejohns, L., & Wilson, A. (2019). Strengthening complex systems for chronic disease prevention: a systematic review. *BMC Public Health*, 19(1), 729. doi: 10.1186/s12889-019-7021-9
- Beauchamp, G. K. & J. A. Mennella. (2009). Early flavor learning and its impact on later feeding behavior. *J Pediatr Gastroenterol Nutr* 48 Suppl 1: S25-30.
- Bell, A. C., Davies, L., Finch, C., Wolfenden, L., Francis, R., Sutherland, L., & Wiggers, R. (2015). An implementation intervention to encourage healthy eating in centre-based child-care services: impact of the Good for Kids Good for Life programme. *Public Health Nutr* 18(9): 1610-1619.
- Bell, A, Hamer, M. Sabia, S. Singh-Manoux, S., Batty, S., & Kivimaki, M. (2015). The natural course of healthy obesity over 20 years. *Journal of the American College of Cardiology* 65(1): 101-102.
- Bell, L. K. & Golley, R. (2015). Interventions for improving young children's dietary intake through early childhood settings : a systematic review. *International Journal of Child Health and Nutrition* 4(1): 14-32.

- Bell, L. K., Hendrie, G., Hartley, J., & Golley, R. (2015). Impact of a nutrition award scheme on the food and nutrient intakes of 2- to 4-year-olds attending long day care. *Public Health Nutr*: 1-9.
- Bellows, B. C., Dufour, R., Bachmann, J., Green, C., & Moore, N. (2013). Bringing Local Food to Local Institutions: A Resource Guide for Farm to Institution Programs. *National Sustainable Agriculture Information Service*, 1-16.
- Bellew, W., Bauman, A., Kite, J., Foley, B., Reece, L., Thomas, M., . . . King, L. (2019). Obesity prevention in children and young people: what policy actions are needed? *Public Health Research & Practice*. *Public Health Res Pract*. 29(1): <https://doi.org/10.17061/phrp2911902>.
- Benjamin Neelon, S. E., & Briley, M. E. (2011). Position of the American Dietetic Association: benchmarks for nutrition in child care. *J Am Diet Assoc*, 111(4), 607-615. doi: 10.1016/j.jada.2011.02.016.
- Beracochea, E., Evans, D. P., & Weinstein, C. (2011). Introduction: Why do rights-based approaches to health matter? *Rights-Based Approaches to Public Health*. New York: Springer Publishing Company, 3-18.
- Bergmeier, H., H. Skouteris, S. Horwood, M. Hooley & Richardson., B. (2014). Associations between child temperament, maternal feeding practices and child body mass index during the preschool years: a systematic review of the literature. *Obes Rev* 15(1): 9-18.
- Biddle, S. J. H., Atkin, A. J., Cavill, N., & Foster, C. (2011). Correlates of physical activity in youth: a review of quantitative systematic reviews. *International Review of Sport and Exercise Psychology*, 4(1), 25-49. doi: 10.1080/1750984X.2010.548528
- Binns, C., Howat, P., & Jancey, J. (2014). Health promotion success in Australia and a note of warning. *Health Promotion Journal of Australia*, 25(3), 157-159. doi: [http://dx.doi.org/10.1071/HEv25n3\\_ED](http://dx.doi.org/10.1071/HEv25n3_ED)
- Birch, L. L. (1998). Development of food acceptance patterns in the first years of life. *Proc Nutr Soc* 57(4): 617-624.
- Birch, L. L. & S. Anzman-Frasca. (2011). Promoting children's healthy eating in obesogenic environments: Lessons learned from the rat. *Physiol Behav* 104(4): 641-645.
- Birch, L. L. & K. K. Davison. (2001). Family environmental factors influencing the developing behavioral controls of food intake and childhood overweight. *Pediatr Clin North Am* 48(4): 893-907.
- Birch, L. L. & A. E. Doub. (2014). Learning to eat: birth to age 2 y. *Am J Clin Nutr* 99(3): 723S-728S.
- Black, L., Matvienko-Sikar, K., Kearney, P.M. (2017). The association between childcare arrangements and risk of overweight and obesity in childhood: A systematic review. *Obes. Rev.* 18: 1170–1190.
- Blake, B. (2015). Developmental psychology: Incorporating Piaget's and Vygotsky's theories in classrooms. *Journal of Cross-Disciplinary Perspectives in Education*. 1 (1).59-67

- Blissett, J., C. Bennett, A. Fogel, G. Harris and S. Higgs (2016). Parental modelling and prompting effects on acceptance of a novel fruit in 2–4-year-old children are dependent on children’s food responsiveness. *British Journal of Nutrition* 115(3): 554-564.
- Bohanna, I., Davis, E., Corr, L., Priest, N., & Tan, H. (2012). Family day care in Australia: A systematic review of research (1996–2010). *Australasian Journal of Early Childhood*, 37(4), 138-146.
- Bollani, L., Bonadonna, A., & Peira, G. (2019). The Millennials’ Concept of Sustainability in the Food Sector. *Sustainability*, 11(10), 2984.
- Bond, M., Wyatt, K., Lloyd, J., & Taylor, R. (2011). Systematic review of the effectiveness of weight management schemes for the under fives. *Obes Rev*, 12(4), 242-253. doi: 10.1111/j.1467-789X.2010.00713.x
- Booth, M. L., L. A. King, D. L. Pagnini, R. L. Wilkenfeld and S. L. Booth (2009). Parents of school students on childhood overweight: The Weight of Opinion Study. *Journal of Paediatrics and Child Health* 45(4): 194-198.
- Branca, Lartey, Oenema, Aguayo, Stordalen, Richardson et al., (2019) Transforming the food system to fight non-communicable diseases *BMJ* 364 doi: <https://doi.org/10.1136/bmj.l296> (Published 28 January 2019)
- Bradbury-Jones, C., Taylor, J., & Herber, O. (2014). How theory is used and articulated in qualitative research: Development of a new typology. *Soc Sci Med*, 120, 135-141. doi: <https://doi.org/10.1016/j.socscimed.2014.09.014>
- Brand, T., Pischke, C. R., Steenbock, B., Schoenbach, J., Poettgen, S., Samkange-Zeeb, F., & Zeeb, H. (2014). What works in community-based interventions promoting physical activity and healthy eating? A review of reviews. *Int J Environ Res Public Health*, 11(6), 5866-5888. doi: 10.3390/ijerph110605866.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. doi: 10.1191/1478088706qp063oa.
- Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. Sage Publications Ltd.
- Briley, M. and M. McAllaster. (2011). Nutrition and the child-care setting. *J Am Diet Assoc* 111(9): 1298-1300.
- Briley ME, Ranjit N, Sweitzer SJ, Almansour F, Roberts-Gray C. (2012). Unbundling outcomes of a multilevel intervention to increase fruit, vegetables and whole grains parents pack for their preschool children in sack lunches. *Am J Health Edu*, 43:135.-42 doi: 10.1080/19325037.2012.10599230.
- Brescoll, V. L., Kersh, R., & Brownell, K. D. (2008). Assessing the Feasibility and Impact of Federal Childhood Obesity Policies. *The ANNALS of the American Academy of Political and Social Science*, 615(1), 178-194. doi: doi:10.1177/0002716207309189.

- Brownell, K. D., R. Kersh, D. S. Ludwig, R. C. Post, R. M. Puhl, M. B. Schwartz and W. C. Willett (2010). Personal Responsibility And Obesity: A Constructive Approach To A Controversial Issue. *Health Affairs* 29(3): 379-387.
- Brownell, K. D. & K. E. Warner. (2009). The Perils of Ignoring History: Big Tobacco Played Dirty and Millions Died. How Similar Is Big Food? *Milbank Quarterly* 87(1): 259-294.
- Byrd-Williams, C. E., E. J. Camp, P. D. Mullen, M. E. Briley & D. M. Hoelscher. (2015). How local and state regulations affect the childcare food environment: A qualitative study of childcare center directors' perspectives. *Infant Child Adolesc Nutr* 7(2): 99-106.
- Caldwell, A. (2016). Examining relationships between family mealtime routines and feeding outcomes in young children with sensory food aversions. In R. Bendixen & E. R. Skidmore (Eds.). *ProQuest Dissertations Publishing*.
- Campbell, K., Hesketh, K., Silverii, A & Abbott, G (2010). Maternal self-efficacy regarding children's eating and sedentary behaviours in the early years: associations with children's food intake and sedentary behaviours. *Int J Pediatr Obes* 5(6): 501-508.
- Campbell, K. J. & Hesketh, K. (2007). Strategies which aim to positively impact on weight, physical activity, diet and sedentary behaviours in children from zero to five years. A systematic review of the literature. *Obesity Reviews* 8(4): 327-338.
- Capewell, S. (2014). Sugar sweetened drinks should carry obesity warnings. *Bmj*,348: g3428.
- Carey G, Malbon E, Carey N, Joyce A, Crammond B, Carey A. (2015). Systems science and systems thinking for public health: a systematic review of the field. *BMJ open*. 5(12):e009002.
- Carnell, S., & Wardle, J. (2008). Appetite and adiposity in children: evidence for a behavioral susceptibility theory of obesity. *Am J Clin Nutr*, 88(1), 22-29.
- Carter, M. A., & Swinburn, B. (2004). Measuring the 'obesogenic' food environment in New Zealand primary schools. *Health promotion international*, 19(1), 15-20.
- Cauchi, D., Glonti, K., Petticrew, M., & Knai, C. (2016). Environmental components of childhood obesity prevention interventions: an overview of systematic reviews. *Obes Rev*, 17(11), 1116-1130. doi: 10.1111/obr.12441
- Centers for Disease Control and Prevention (CDC). (2011). Ten great public health achievements—United States, 2001-2010. *MMWR. Morbidity and Mortality Weekly Report*, 60(19), 619.
- Centre of Population Health. (2016). *Premier's Priority: Reduce Overweight and Obesity Rates of Children by 5% over 10 Years*. Australia. <https://www.health.nsw.gov.au/heal/Publications/Premiers-priority-childhood-obesity-delivery-plan.pdf>.
- Chai, L. K., Macdonald-Wicks, L., Hure, A. J., Burrows, T. L., Blumfield, M. L., Smith, R., & Collins, C. E. (2016). Disparities exist between the Australian Guide to Healthy Eating and the dietary intakes of young children aged two to three years. *Nutrition & Dietetics*, 73(4), 312-320. doi: 10.1111/1747-0080.12203.

- Charakida, M., & Deanfield, J. E. (2018). BMI trajectories from childhood: the slippery slope to adult obesity and cardiovascular disease. *Eur Heart J*, *39*(24), 2271-2273. doi: 10.1093/eurheartj/ehy218.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Sage Publications Ltd.
- Chronic Disease Prevention Directorate. (2017). *Western Australian Health Promotion Strategic Framework 2017–2021* Department of Health, Western Australia; [https://ww2.health.wa.gov.au/~/\\_/media/Files/Corporate/Reports%20and%20publications/HPSF/WA-Health-Promotion-Strategic-Framework-2017-2021.pdf](https://ww2.health.wa.gov.au/~/_/media/Files/Corporate/Reports%20and%20publications/HPSF/WA-Health-Promotion-Strategic-Framework-2017-2021.pdf).
- Clark, H. R., Goyder, E., Bissell, P., Blank, L., & Peters, J. (2007). How do parents' child-feeding behaviours influence child weight? Implications for childhood obesity policy. *J Public Health (Oxf)*, *29*(2), 132-141. doi: 10.1093/pubmed/fdm012.
- Cleland, P., Byrne, R., Vidgen, H., Irvine, S., Farrell, A., & Gallegos, D. (2018). Advancing Australia's Agenda for Young Children's Health and Wellbeing: Empirical Insights into Educator Knowledge, Confidence and Intentions in Promoting Children's Learning, Eating, Active Play and Sleep (LEAPS). *Australasian Journal of Early Childhood*, *43*(2), 55–63. <https://doi.org/10.23965/AJEC.43.2.06>
- Cohen, J. F., Richardson, S., Parker, E., Catalano, P. J., & Rimm, E. B. (2014). Impact of the new US Department of Agriculture school meal standards on food selection, consumption, and waste. *American journal of preventive medicine*, *46*(4), 388-394.
- Colagiuri, S., Lee, C. M., Colagiuri, R., Magliano, D., Shaw, J. E., Zimmet, P. Z., & Caterson, I. D. (2010). The cost of overweight and obesity in Australia. *Med J Aust*, *192*(5), 260-264.
- Cole, A., Vidgen, H., & Cleland, P. (2017). Food provision in early childhood education and care services: Exploring how staff determine nutritional adequacy. *Nutr Diet*, *74*(1), 105-110. doi: 10.1111/1747-0080.12310.
- Colebatch, H. (2011). *Policy Analysis* (1st ed.). Thousand Oaks CA 1st: Sage in association with the International Political Science Association.
- Collins, K., Watson, J. F., & Collins, C. E. (2014). Food and beverage portion sizes in Australian children: a secondary analysis of 1995 and 2007 national data. *BMC Public Health*, *14*(1), 517. doi: 10.1186/1471-2458-14-517.
- Collins, C., & Stockton, C. (2018). The central role of theory in qualitative research. *International Journal of Qualitative Methods*, *17*, 1-10.
- Commonwealth of Australia. (2013). *The Longitudinal Study of Australian Children Annual Report 2011-2012*. <https://growingupinaustralia.gov.au/sites/default/files/asr2011.pdf>
- Connelly, J. B. (2007). Evaluating complex public health interventions: theory, methods and scope of realist enquiry. *J Eval Clin Pract*, *13*(6), 935-941. doi: 10.1111/j.1365-2753.2006.00790.x
- Connelly, J. B., Duaso, M. J., & Butler, G. (2007). A systematic review of controlled trials of interventions to prevent childhood obesity and overweight: a realistic synthesis of the evidence. *Public Health*, *121*(7), 510-517. doi: 10.1016/j.puhe.2006.11.015

- Consumers International and World Obesity Federation. (2014). *Global Convention to Protect and Promote Healthy Diets in Children*.  
<https://www.consumersinternational.org/media/2211/recommendations-for-a-convention-on-healthy-diets-low-res-for-web.pdf>.
- Cooke, L. J., Chambers, L. C., Anez, E. V., Croker, H. A., Boniface, D., Yeomans, M. R., & Wardle, J. (2011). Eating for pleasure or profit: the effect of incentives on children's enjoyment of vegetables. *Psychol Sci*, 22(2), 190-196. doi: 10.1177/0956797610394662.
- Corbin, J. & Strauss. A., (2008). *Basics of qualitative research: techniques and procedures for developing grounded theory*. 3rd Ed. SAGE London.
- Costa, S., Benjamin-Neelon, S. E., Winpenny, E., Phillips, V., & Adams, J. (2019). Relationship Between Early Childhood Non-Parental Childcare and Diet, Physical Activity, Sedentary Behaviour, and Sleep: A Systematic Review of Longitudinal Studies. *International journal of environmental research and public health*, 16(23), 4652. doi:10.3390/ijerph16234652.
- Costa, S.; Adams, J.; Gonzalez-Nahm, S.; Benjamin Neelon, S.E.(2017). Childcare in Infancy and Later Obesity: A Narrative Review of Longitudinal Studies. *Curr. Pediatr. Rep.* 5, 118–131.
- Coulthard, H., & Sealy, A. (2017). Play with your food! Sensory play is associated with tasting of fruits and vegetables in preschool children. *Appetite*, 113, 84-90.
- Craigie, A. M., Lake, A. A., Kelly, S. A., Adamson, A. J., & Mathers, J. C. (2011). Tracking of obesity-related behaviours from childhood to adulthood: A systematic review. *Maturitas*, 70(3), 266-284. doi: 10.1016/j.maturitas.2011.08.005.
- Creswell, J. (2014). *Research Design Qualitative, Quantitative, Mixed Methods Approaches USA*. SAGE Publications Ltd.
- Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE publication Ltd.
- Crotty, M. (1998). *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: SAGE Publications Ltd.
- Crowle, J., & Turner, E. (2010). *Childhood Obesity: An Economic Perspective* Productivity Commission Staff Working Paper. Melbourne: Productivity Commission Staff Working Paper, Melbourne.
- Cruwys, T., Bevelander, K. E., & Hermans, R. C. (2015). Social modeling of eating: a review of when and why social influence affects food intake and choice. *Appetite*, 86, 3-18. doi: 10.1016/j.appet.2014.08.035
- Cullen, K. W., Baranowski, T., Owens, E., Marsh, T., Rittenberry, L., & De Moor, C. (2003). Availability, accessibility, and preferences for fruit, 100% fruit juice, and vegetables influence children's dietary behavior. *Health Education & Behavior*, 30(5), 615-626.
- Daly, J. (2009). Qualitative method and the curse the illustrative quotation. *Aust N Z J Public Health*, 33(5), 405-406. doi: 10.1111/j.1753-6405.2009.00419.x
- Dazeley, P. and C. Houston-Price. (2015). Exposure to foods' non-taste sensory properties. A nursery intervention to increase children's willingness to try fruit and vegetables. *Appetite* 84: 1-6.

- de Wild, V. W., de Graaf, C., & Jager, G. (2013). Effectiveness of flavour nutrient learning and mere exposure as mechanisms to increase toddler's intake and preference for green vegetables. *Appetite, 64*, 89-96.
- Dev, D. A., Hatton-Bowers, H., Guo, Y., Hulse, E., Rida, Z., Burger, C., ... & Foged, J. (2017). Nutrition Environment and Practices of Family Childcare Homes and Child Care Centers in Nebraska. *Journal of Nutrition Education and Behavior, 49*(7), S88.
- Department Education & Training. (2018). *Early Childhood and Child Care in Summary September quarter 2017* (p. 19). Canberra, Australia <https://www.education.gov.au/early-childhood-and-child-care-reports>
- Department of Health UK. (2011). *Healthy Lives, Healthy People: A call to action on obesity in England*. London England UK.
- Department of Health and Ageing. (2009). *Get Up and Grow Healthy Eating and Physical Activity for Early Childhood*. Canberra, Australia: Department of Health and Ageing, Australian Government.
- de Silva-Sanigorski, A., Prosser, L., Carpenter, L., Honisett, S., Gibbs, L., Moodie, M., . . . Waters, E. (2010). Evaluation of the childhood obesity prevention program Kids--'Go for your life'. *BMC Public Health, 10*, 288. doi: 10.1186/1471-2458-10-288
- Delormier, T., Frohlich, K. L., & Potvin, L. (2009). Food and eating as social practice--understanding eating patterns as social phenomena and implications for public health. *Social Health Illn, 31*(2), 215-228. doi: 10.1111/j.1467-9566.2008.01128.x
- Denzin, N. K., & Lincoln, Y. S. (1994). *Handbook of qualitative research*. Sage Publications Ltd.
- Dev, D. A., B. A. McBride, K. E. Speirs, K. A. Blitch & N. A. Williams. (2016). Great Job Cleaning Your Plate Today! Determinants of Child-Care Providers' Use of Controlling Feeding Practices: An Exploratory Examination. *J Acad Nutr Diet 116*(11): 1803-1809.
- Dev, D. A., Byrd-Williams, C., Ramsay, S., McBride, B., Srivastava, D., Murriel, A., . . . Adachi-Mejia, A. M. (2017). Engaging Parents to Promote Children's Nutrition and Health. *Am J Health Promot, 31*(2), 153-162. doi: 10.1177/0890117116685426
- Dev, D. A., Carraway-Stage, V., Schober, D. J., McBride, B. A., Kok, C. M., & Ramsay, S. (2017). Implementing the Academy of Nutrition and Dietetics Benchmarks for Nutrition Education for Children: Child-Care Providers' Perspectives. *J Acad Nutr Diet*. doi: <https://doi.org/10.1016/j.jand.2017.07.001>
- Dev, D. A., Garcia, A. S., Tovar, A., Hatton-Bowers, H., Franzen-Castle, L., Rida, Z., . . . Sheridan, S. (2020). Contextual Factors Influence Professional Development Attendance Among Child Care Providers in Nebraska. *J Nutr Educ Behav, 52*(3), 270-280. doi: 10.1016/j.jneb.2019.09.011
- Dietz, W. H. (1998). Health consequences of obesity in youth: childhood predictors of adult disease. *Pediatrics, 101*(3 Pt 2), 518-525.

- Dixon P. (2014). Child Rights Situation Analysis Guidelines (pp. 1-48): Save the Children.  
[https://resourcecentre.savethechildren.net/sites/default/files/documents/crsa\\_guidelines2.pdf](https://resourcecentre.savethechildren.net/sites/default/files/documents/crsa_guidelines2.pdf)
- Dixon, J. & B. Isaacs. (2013). Why sustainable and 'nutritionally correct' food is not on the agenda: Western Sydney, the moral arts of everyday life and public policy. *Food Policy* 43: 67-76.
- Dixon, L. B., L. Kettel Khan, S. L. Yoong, M. Finch, N. Nathan, J. Wiggers, C. Lecathelinais, J. Jones, P. Dodds and L. Wolfenden (2016). A longitudinal study assessing childcare services' adoption of obesity prevention policies and practices. *Public Health Nutr* 52(7): 765-770.
- Department Health & Ageing (DoHA). (2008). *2007 Australian national children's nutrition and physical activity survey. Main findings.*  
[https://www1.health.gov.au/internet/main/publishing.nsf/Content/8F4516D5FAC0700ACA257BF0001E0109/\\$File/childrens-nut-phys-survey.pdf](https://www1.health.gov.au/internet/main/publishing.nsf/Content/8F4516D5FAC0700ACA257BF0001E0109/$File/childrens-nut-phys-survey.pdf).
- Department Education, Skills & Employment. (2019). *Childcare data for September quarter 2019.*  
<https://docs.education.gov.au/node/53204>
- D'Onise, K., Lynch, J. W., Sawyer, M. G., & McDermott, R. A. (2010). Can preschool improve child health outcomes? A systematic review. *Soc Sci Med*, 70(9), 1423-1440. doi: 10.1016/j.socscimed.2009.12.037
- Douglas, F., J. Clark, L. Craig, J. Campbell & G. McNeill. (2014). "It's a balance of just getting things right": mothers' views about pre-school childhood obesity and obesity prevention in Scotland." *BMC Public Health* 14: 1009.
- Downs, S. M., Farmer, A., Quintanilha, M., Berry, T. R., Mager, D. R., Willows, N. D., & McCargar, L. J. (2011). Alberta Nutrition Guidelines for Children and Youth: awareness and use in schools. *Can J Diet Pract Res*, 72(3), 137-140. doi: 10.3148/72.3.2011.137.
- Dyer, S. M., Gomersall, J. S., Smithers, L. G., Davy, C., Coleman, D. T., & Street, J. M. (2017). Prevalence and characteristics of overweight and obesity in indigenous Australian children: a systematic review. *Critical reviews in food science and nutrition*, 57(7), 1365-1376.
- Egger, G. and B. Swinburn. (1997). An "ecological" approach to the obesity pandemic. *BMJ* 315(7106): 477-480.
- Elford, L., & Brown, A. (2014). Exploring child-feeding style in childcare settings: How might nursery practitioners affect child eating style and weight? *Eating Behaviors*, 15(2), 314-317. doi: <http://dx.doi.org/10.1016/j.eatbeh.2014.04.001>.
- Erinosho, T., Dixon, B., Young, C., Brotman, L., & Hayman, L. (2011). Nutrition practices and children's dietary intakes at 40 child-care centers in New York City. *J Am Diet Assoc* 111(9): 1391-1397.
- Erinosho, T. O., Dixon, B., Young, C., Brotman, L., Hayman, L. (2013). Caregiver food behaviours are associated with dietary intakes of children outside the child-care setting. *Public Health Nutr* 16(7): 1263-1272.
- Erinosho, T. O., Hales, D., McWilliams, C., Emunah, J., & Ward, D.S. (2012). Nutrition policies at child-care centers and impact on role modeling of healthy eating behaviors of caregivers. *J Acad Nutr Diet* 112(1): 119-124.



- Esdaile, E., Thow, A. M., Gill, T., Sacks, G., Golley, R., Love, P., ... & Rissel, C. (2019). National policies to prevent obesity in early childhood: Using policy mapping to compare policy lessons for Australia with six developed countries. *Obesity Reviews*, 20(11), 1542-1556.
- Evans, C., Cleghorn, C., Greenwood, D., & Cade, J. (2010). A comparison of British school meals and packed lunches from 1990 to 2007: meta-analysis by lunch type. *British Journal of Nutrition*, 104(4). doi:10.1017/S0007114510001601
- Evans, C. E. L., & Harper, C. E. (2009). A history and review of school meal standards in the UK. *Journal of Human Nutrition and Dietetics*, 22(2), 89-99. <https://doi.org/10.1111/j.1365-277X.2008.00941.x>
- Framework, E. Y. L. (2009). *Early years learning framework: Belonging, being, becoming*. Canberra: Department of Education, Employment, Training and Workplace Relations for the Council of Australian Governments..
- FAO (Food and Agriculture Organisation), & WHO. (2014). *Public Interest Civil Society Organizations' and Social Movements' Forum Declaration to the Second International Conference on Nutrition (ICN2)*. Second International Conference on Nutrition; 2014; Rome, Italy. *Development*, 57(2), 135-140.
- FAO. (2014). *Rome declaration on nutrition*. Second Conference on Nutrition. Rome: Food and Agriculture Organisation. <http://www.fao.org/3/a-ml542e.pdf>.
- FANSIG. (2017). Joint Policy Statement: Towards a National Nutrition Policy for Australia. Deakin. <https://www.nutritionaustralia.org/sites/default/files/2017%20-%20FANSIG%20-%20Towards%20a%20National%20Nutrition%20Policy%20for%20Australia%20-%20Position%20Statement.pdf>
- Farmer, A. P., Nikolopoulos, H., McCargar, L., Berry, T., & Mager, D. (2015). Organizational characteristics and processes are important in the adoption of the Alberta Nutrition Guidelines for Children and Youth in child-care centres. *Public Health Nutrition* 18( 9), 1593-1601. doi: 10.1017/S1368980014001955.
- Farrer, O., Sasanelli, L., Matwiejczyk, L., Yaxley, A., & Miller, M. (2019). The role of dietitians in residential aged care: How do cooks and chefs perceive their contribution?. *Australasian journal on ageing*, 38(2), 85-90.
- Fereday, J., & Muirane, E. (2006). Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods*, 5(1), 80-92. doi: 10.1177/160940690600500107.
- Ferguson, L., Tarantola, D., Hoffmann, M., & Gruskin, S. (2016). Non-communicable diseases and human rights: Global synergies, gaps and opportunities. *Global Public Health*, 1-28. doi: 10.1080/17441692.2016.1158847.

- Ferraro, K. F., Thorpe, R., & Wilkinson, R. (2003). The life course of severe obesity: does childhood overweight matter? *J Gerontol B Psychol Sci Soc Sci* 58(2): S110-119.
- Finnish National Board of Education (2015) *Legislation on Finnish school meals*.  
[http://www.oph.fi/koulutus\\_ja\\_tutkinnot/perusopetus/hyvinvointi\\_ja\\_turvallisuus/kouluruo\\_kailu](http://www.oph.fi/koulutus_ja_tutkinnot/perusopetus/hyvinvointi_ja_turvallisuus/kouluruo_kailu).
- Fildes, A., van Jaarsveld, C., Llewellyn, C., Fisher, A., Cooke, L., & Wardle, J. (2014). Nature and nurture in children's food preferences. *The American Journal of Clinical Nutrition* 99(4): 911-917.
- Finch, M., Seward, K., Wedesweiler, T., Stacey, F., Grady, A., Jones, J., . . . Yoong, S. L. (2019). Challenges of Increasing Childcare Center Compliance With Nutrition Guidelines: A Randomized Controlled Trial of an Intervention Providing Training, Written Menu Feedback, and Printed Resources. *Am J Health Promot*, 33(3), 399-411. doi: 10.1177/0890117118786859
- Finch, M., Jones, J., Yoong, S., Wiggers, J., & Wolfenden, L. (2016). Effectiveness of centre-based childcare interventions in increasing child physical activity: a systematic review and meta-analysis for policymakers and practitioners. *Obesity Reviews* 17(5): 412-428.
- Finch, M., Wiggers, J., Wyse, R., Jones, J., Gillham, G., Yoong, S., Dixon, L., & Breck, A. (2016). Comparison of children's food and beverage intakes with national recommendations in New York City child-care centres. *BMJ Open* 19(13): 2451-2457.
- Finch, M., Yoong, S., Thomson, R., Seward, K., Cooney, K., Jones, J., Fielding, A., Wiggers, J., Gillham, W., & Wolfenden, L. (2015). A pragmatic randomised controlled trial of an implementation intervention to increase healthy eating and physical activity-promoting policies, and practices in centre-based childcare services: study protocol. *BMJ Open*, 5(5), e006706. doi: 10.1136/bmjopen-2014-006706.
- Finegood, D. T., Merth, T. D., & Rutter, H. (2010). Implications of the foresight obesity system map for solutions to childhood obesity. *Obesity*, 18(S1), S13-S16.
- Finkelstein, E. A., W. C. K. Graham & R. Malhotra. (2014). Lifetime Direct Medical Costs of Childhood Obesity. *Pediatrics* 133(5): 854-862.
- Finucane, M. M., Stevens, G. A., Cowan, M. J., Danaei, G., Lin, J. K., Paciorek, C. J., ... & Farzadfar, F. (2011). National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9·1 million participants. *The lancet*, 377(9765), 557-567.
- Flegal, K. M., Kit, B. K., Orpana, H., & Graubard, B. I. (2013). Association of all-cause mortality with overweight and obesity using standard body mass index categories: a systematic review and meta-analysis. *Jama*, 309(1), 71-82.
- Fossey, E., Harvey, C., McDermott, F., & Davidson, L. (2002). Understanding and Evaluating Qualitative Research. *Australian & New Zealand Journal of Psychiatry*, 36(6), 717-732. doi: 10.1046/j.1440-1614.2002.01100.x.

- Gable, S., Krull, J. L., & Chang, Y. (2009). Implications of overweight onset and persistence for social and behavioral development between kindergarten entry and third grade. *Applied Development Science*, 13(2), 88-103.
- Garcia, K. (2008). Fat Fight: The Risks and Consequences of the Federal Government's Failing Public Health Campaign. *The Penn State Law Review* 112(2): 529-586.
- Gerards, S. M. P. L., & Kremers, S. P. J. (2015). The Role of Food Parenting Skills and the Home Food Environment in Children's Weight Gain and Obesity. *Current obesity reports*, 4(1), 30-36. doi: 10.1007/s13679-015-0139-x.
- Gerritsen, S., Wall, C., & Morton, S. (2016). Child-care nutrition environments: results from a survey of policy and practice in New Zealand early childhood education services. *Public Health Nutr*, 19(9), 1531-1542. doi: 10.1017/S1368980015002955.
- Gerritsen, S. (2016). Nutrition education for early childhood managers, teachers and nursery cooks: a prerequisite for effective obesity prevention. *Public Health*, 140, 56-58. doi: <http://dx.doi.org/10.1016/j.puhe.2016.05.025>.
- Gerritsen, S., Dean, B., & Wall, C. R. (2017). Do childcare menus meet nutrition guidelines? Quantity, variety and quality of food provided in New Zealand Early Childhood Education services. *Aust N Z J Public Health*, 41(4), 345-351. <https://doi.org/10.1111/1753-6405.12667>.
- Global BMI Collaboration. (2016). Body-mass index and all-cause mortality: individual-participant-data meta-analysis of 239 prospective studies in four continents. *The Lancet* 388(10046): 776-786.
- Goldbohm, R. A., Rubingh, C. M., Lanting, C. I., & Joosten, K. F. (2016). Food consumption and nutrient intake by children aged 10 to 48 months attending day care in the Netherlands. *Nutrients*, 8(7), 428.
- Goldhagen, J. (2003). Children's Rights and the United Nations Convention on the Rights of the Child. *Pediatrics*, 112 (Supplement 3), 742-745.
- Golley, R. K., Bell, L., Matwiejczyk, L., & Hartley, J. (2012). South Australian Long Day Care Centres engaged with a nutrition incentive award scheme show consistency with mealtime practice guidelines. *Nutrition & Dietetics*, 69(2), 130-136. doi: 10.1111/j.1747-0080.2012.01586.x.
- Goodell, L. S., Stage, V. C., & Cooke, N. K. (2016). Practical Qualitative Research Strategies: Training Interviewers and Coders. *J Nutr Educ Behav*, 48(8), 578-585.e571. doi: <https://doi.org/10.1016/j.jneb.2016.06.001>.
- Gortmaker, S. L., Swinburn, B. A., Levy, D., Carter, R., Mabry, P. L., Finegood, D. T., ... & Moodie, M. L. (2011). Changing the future of obesity: science, policy, and action. *The Lancet*, 378(9793), 838-847.
- Gortmaker, S., & Taveras, E. (2014). Who Becomes Obese during Childhood — Clues to Prevention. *The New England Journal of Medicine*, 370(5), 475-476.
- Gostin, L. O., & Wiley, L. F. (2016). Public health law: power, duty, restraint. Univ of California Press.
- Government of South Australia. (2011). *Eat Well Be Active Strategy for South Australia 2011-2016*

Department of Health. Public Health and Clinical Systems Division. South Australia. 2011  
[https://www.sahealth.sa.gov.au/wps/wcm/connect/e8f366804951e78bb999fb3b73084503/  
EWBA-Strategy-PHCS-HealthPromotion-  
20111207.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-  
e8f366804951e78bb999fb3b73084503-mMHS06N.](https://www.sahealth.sa.gov.au/wps/wcm/connect/e8f366804951e78bb999fb3b73084503/EWBA-Strategy-PHCS-HealthPromotion-20111207.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-e8f366804951e78bb999fb3b73084503-mMHS06N)

- Grady, A., Wolfenden, L., Rissel, C., Green, S., Reilly, K., & Yoong, S. L. (2018). Effectiveness of a dissemination strategy on the uptake of an online menu planning program: A controlled trial. *Health Promotion Journal of Australia, 30*, 20-25.
- Graff, S. K., M. Kappagoda, H. M. Wooten, A. K. McGowan & Ashe, M. (2012). Policies for healthier communities: historical, legal, and practical elements of the obesity prevention movement. *Annu Rev Public Health 33*: 307-324.
- Granheim, S., Vandevijvere, S., & Torheim, E. (2019). The potential of a human rights approach for accelerating the implementation of comprehensive restrictions on the marketing of unhealthy foods and non-alcoholic beverages to children, *Health Promotion International, 34*(3) 591–600, <http://dx.doi.org/10.1093/heapro/dax100>
- Grbich, C. (2012). *Qualitative data analysis: An introduction*. Sage Publications Ltd.
- Grbich, C. (1998). *Qualitative research in health: an introduction*. Sage Publications Ltd.
- Greenway, J. (2008). Childhood obesity: bringing children's rights discourse to public health policy. *Community Pract 81*(5): 17-21.
- Gregory, J. E., Paxton, S & Brozovic, A. (2011). Maternal feeding practices predict fruit and vegetable consumption in young children. Results of a 12-month longitudinal study. *Appetite 57*(1): 167-172.
- Guariguata, L., D. R. Whiting, I. Hambleton, J. Beagley, U. Linnenkamp & Shaw, J. (2014). Global estimates of diabetes prevalence for 2013 and projections for 2035. *Diabetes Research and Clinical Practice 103*(2): 137-149.
- Gubbels, J. S., Van Kann, D. H., de Vries, N. K., Thijs, C., & Kremers, S. P. (2014). The next step in health behavior research: the need for ecological moderation analyses-an application to diet and physical activity at childcare. *International Journal of Behavioral Nutrition and Physical Activity, 11*(1), 52.
- Gubbels, J. S., Gerards, S. M., & Kremers, S. P. (2015). Use of food practices by childcare staff and the association with dietary intake of children at childcare. *Nutrients, 7*(4), 2161-2175. doi: 10.3390/nu7042161.
- Gubbels, J. S., Stessen, K., van de Kolk, I., de Vries, N. K., Thijs, C., & Kremers, S. P. (2018). Energy balance-related parenting and child-care practices: The importance of meso-system consistency. *PLoS One, 13*(9), e0203689. doi: 10.1371/journal.pone.0203689.
- Gubbels, J. S., Van Kann, D. H., Cardon, G., & Kremers, S. P. (2018). Activating childcare environments for all children: The importance of children's individual needs. *International journal of environmental research and public health, 15*(7), 1400.

- Guerra, P. H., da Silveira, J. A., & Salvador, E. P. (2016). Physical activity and nutrition education at the school environment aimed at preventing childhood obesity: evidence from systematic reviews. *J Pediatr (Rio J)*, *92*(1), 15-23. doi: 10.1016/j.jpmed.2015.06.005
- Haddad, L., Achadi, E., Bendeck, M. A., Ahuja, A., Bhatia, K., Bhutta, Z., ... & Eriksen, K. (2015). The Global Nutrition Report 2014: actions and accountability to accelerate the world's progress on nutrition. *The Journal of nutrition*, *145*(4), 663-671.
- Haines, J., Haycraft, E., Lytle, L., Nicklaus, S., Kok, F. J., Merdji, M., . . . Hughes, S. O. (2019). Nurturing Children's Healthy Eating: Position statement. *Appetite*, *137*, 124-133. doi: <https://doi.org/10.1016/j.appet.2019.02.007>.
- Hammarberg, K., Kirkman, M., & De Lacey, S. (2016). Qualitative research methods: when to use them and how to judge them. *Human Reproduction*, *31*(3), 498-501.
- Handsley, E., C. Nehmy, K. Mehta & Coveney, J. (2014). A Children's Rights Perspective on Food Advertising to Children. *The International Journal of Children's Rights* *22*(1): 93-134.
- Hardy, L. L., King, L., Kelly, B., Farrell, L., & Howlett, S. (2010). Munch and Move: evaluation of a preschool healthy eating and movement skill program. *Int J Behav Nutr Phys Act*, *7*, 80. doi: 10.1186/1479-5868-7-80
- Hardy, L. L., Jin, K., Miharshahi, S., & Ding, D. (2019). Trends in overweight, obesity, and waist-to-height ratio among Australian children from linguistically diverse backgrounds, 1997 to 2015. *International Journal of Obesity*, *43*(1), 116-124.
- Harnack, L.J., Oakes, J.M., French, S.A. et al. (2012) Results from an experimental trial at a Head Start center to evaluate two meal service approaches to increase fruit and vegetable intake of preschool aged children. *Int J Behav Nutr Phys Act* *9*, 51. <https://doi.org/10.1186/1479-5868-9-51>
- Harris, J. E., Gleason, P. M., Sheean, P. M., Boushey, C., Beto, J. A., & Bruemmer, B. (2009). An Introduction to Qualitative Research for Food and Nutrition Professionals. *J Am Diet Assoc*, *109*(1), 80-90. doi: 10.1016/j.jada.2008.10.018
- Harrist, A. W., Swindle, T. M., Hubbs-Tait, L., Topham, G. L., Shriver, L. H., & Page, M. C. (2016). The social and emotional lives of overweight, obese, and severely obese children. *Child Development*, *87*(5), 1564-1580.
- Huang, T. T., Cawley, J. H., Ashe, M., Costa, S. A., Frerichs, L. M., Zwicker, L., ... & Kumanyika, S. K. (2015). Mobilisation of public support for policy actions to prevent obesity. *The Lancet*, *385*(9985), 2422-2431.
- Hawkes, C., Smith, T. G., Jewell, J., Wardle, J., Hammond, R. A., Friel, S., . . . Kain, J. (2015). Smart food policies for obesity prevention. *Lancet*, *385*(9985), 2410-2421. doi: 10.1016/S0140-6736(14)61745-1
- Hayes, A., Chevalier, A., D'Souza, M., Baur, L., Wen, L. M., & Simpson, J. (2016). Early childhood obesity: Association with healthcare expenditure in Australia. *Obesity*, *24*(8), 1752-1758.

- Hayes, A. J., Lung, T. W. C., Bauman, A., & Howard, K. (2017). Modelling obesity trends in Australia: unravelling the past and predicting the future. *International journal of obesity*, 41(1), 178-185.
- Health Canada. (2019). *Canada's Dietary Guidelines for Health Professionals and Policy Makers*. <https://food-guide.canada.ca/static/assets/pdf/CDG-EN-2018.pdf>.
- Hemmingson E. (2018). Early Childhood Obesity Risk Factors: Socioeconomic Adversity, Family Dysfunction, Offspring Distress, and Junk Food Self-Medication. *Current obesity reports*, 7(2), 204–209. doi:10.1007/s13679-018-0310-2
- Hendriks, A. M., Kremers, S. P., Gubbels, J. S., Raat, H., de Vries, N. K., & Jansen, M. W. (2013). Towards health in all policies for childhood obesity prevention. *J Obes*, 632540. doi: 10.1155/2013/632540.
- Hendy, H. M. (2002). Effectiveness of trained peer models to encourage food acceptance in preschool children. *Appetite*, 39(3), 217-225.
- Hendrie, G. A., Brindal, E., Corsini, N., Gardner, C., Baird, M., & Golley, R. (2012). Combined Home and School Obesity Prevention Interventions for Children: What Behavior Change Strategies and Intervention Characteristics Are Associated With Effectiveness?. *Health Education & Behavior*, 39(2): 159-171.
- Hendrie, G., Baird, D., Golley, S., & Noakes, M. (2016). CSIRO Healthy Diet Score 2016. Retrieved September, 10, 2016.
- Hesketh, K. D. & Campbell, K. (2010). Interventions to prevent obesity in 0-5 year olds: an updated systematic review of the literature. *Obesity* 18(1): S27-35.
- Hill, J. O., & Trowbridge, F. L. (1998). Childhood obesity: future directions and research priorities. *Pediatrics*, 101(3), 570-574.
- Hirsch, T., Lim, C., & Otten, J. J. (2016). What's for Lunch? A Socio-ecological Approach to Childcare Nutrition. *Proceedings of the 2016 ACM Conference on Designing Interactive Systems* 1160-1171.
- HM Government (2016). *Childhood Obesity: A Plan for Action*. <https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action>.
- Hodges, E. A., Smith, C., Tidwell, S., & Berry, D. (2013). Promoting physical activity in preschoolers to prevent obesity: a review of the literature. *J Pediatr Nurs* 28(1): 3-19.
- Hoelscher, D. M., Kirk, S., Ritchie, L., Cunningham-Sabo, L., & Academy Positions, C. (2013). Position of the Academy of Nutrition and Dietetics: interventions for the prevention and treatment of pediatric overweight and obesity. *J Acad Nutr Diet*, 113(10), 1375-1394. doi: 10.1016/j.jand.2013.08.004
- Horodyski, M. A., & Stommel, M. (2005). Nutrition education aimed at toddlers: an intervention study. *Pediatric nursing*, 31(5).

- Horne, P.J., Hardman, C.A., Lowe, C.F., Tapper, K., LeNoury, J., Madden, P. (2009). Increasing parental provision and children's consumption of lunchbox fruit and vegetables in Ireland: the Food Dudes intervention. *European journal of clinical nutrition*, 63(5), 613-618.
- Howard, A. J., Mallan, K. M., Byrne, R., Magarey, A., & Daniels, L. A. (2012). Toddlers' food preferences. The impact of novel food exposure, maternal preferences and food neophobia. *Appetite*, 59(3), 818-825.
- Horne, P. J., Greenhalgh, J., Erjavec, M., Lowe, C. F., Viktor, S., & Whitaker, C. J. (2011). Increasing pre-school children's consumption of fruit and vegetables. A modelling and rewards intervention. *Appetite*, 56(2), 375-385. doi: <http://dx.doi.org/10.1016/j.appet.2010.11.146>.
- Hsieh, H.-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277-1288. doi: 10.1177/1049732305276687
- Hughes, S. O., Power, T. G., Fisher, J. O., Mueller, S., & Nicklas, T. A. (2005). Revisiting a neglected construct: parenting styles in a child-feeding context. *Appetite*, 44(1), 83-92.. doi: 10.1016/j.appet.2004.08.007.
- Hughes, S. O., & Frazier-Wood, A. C. (2016). Satiety and the self-regulation of food take in children: A potential role for gene-environment interplay. *Current Obesity Reports*, 5(1), 81-87.
- Hunt, P. (2009). Missed opportunities: human rights and the Commission on Social Determinants of Health. *Global Health Promotion*, 16(1\_suppl), 36-41.
- Hunter, D. J. & Reddy, K. (2013). Noncommunicable diseases. *N Engl J Med* 369(14): 1336-1343.
- Hurley, K., Cross, M., & Hughes, S. (2011) A Systematic Review of Responsive Feeding and Child Obesity in High-Income Countries, *The Journal of Nutrition*, 141 (3), 495–501, <https://doi.org/10.3945/jn.110.130047>
- Iaia, M., Pasini, M., Burnazzi, A., Vitali, P., Allara, E., & Farneti, M. (2017). An educational intervention to promote healthy lifestyles in preschool children: a cluster-RCT. *International Journal of Obesity*, 41(4), 582-590.
- Ierodiakonou, D., Garcia-Larsen, V., Logan, A., & et al. (2016). Timing of allergenic food introduction to the infant diet and risk of allergic or autoimmune disease: A systematic review and meta-analysis. *JAMA*, 316(11), 1181-1192. doi: 10.1001/jama.2016.12623
- Ingleby, R., Prosser, L., & Waters, E. (2008). UNCROC and the prevention of childhood obesity: the right not to have food advertisements on television. *J Law Med* 16(1): 49-56.
- International Food Policy Research Institute. (2014). *Global Nutrition Report 2014: Actions and Accountability to Accelerate the World's Progress on Nutrition*. Washington, DC. <https://www.ifpri.org/publication/global-nutrition-report-2014-actions-and-accountability-accelerate-worlds-progress>.
- Ishida, H. (2016) Role of School Meal Services in Nutrition. *J. Nutritional Science & Vitaminology*, 61, p.S20-S22 <https://doi.org/10.3177/jnsv.61.S20>

- Ishida, H. (2018). The history, current status, and future directions of the school lunch program in Japan. *The Japanese Journal of Nutrition and Dietetics*, 76(Supplement), S2-S11.
- Jackson, A. A., Wiseman, M., & Wootton, S. (2014). Tackling the obesity crisis: how do we 'measure up'? *Archives of Disease in Childhood* 99(2): 95-98.
- Jarpe-Ratner, E., Folkens, S., Sharma, S., Daro, D., & Edens, N. (2016). An Experiential Cooking and Nutrition Education Program Increases Cooking Self-Efficacy and Vegetable Consumption in Children in Grades 3&8. *Journal of Nutrition Education and Behavior* 48(10): 697-705.e691.
- Jennings, A., McEvoy, S., & Corish, C. (2011). Nutritional practices in full-day-care pre-schools. *Journal of Human Nutrition & Dietetics* 24(3): 245-259.
- Johanna Briggs Institute. (2014). Joanna Briggs Institute Reviewers' Manual: 2014 edition / Supplement *Johanna Briggs Institute Reviewers Manual 2014 Methodology for JBI Umbrella Reviews* (Vol. Appendix 3, pp. 34). Australia: Johanna Briggs Institute.
- Johansson, E., & Berthelsen, D. (2014). The birthday cake: Social relations and professional practices around mealtimes with toddlers in child care. In *Lived spaces of infant-toddler education and care* (pp. 75-88). Springer, Dordrecht.
- Johnson, S. L. (2016). Developmental and Environmental Influences on Young Children's Vegetable Preferences and Consumption. *Advances in Nutrition*, 7(1), 220S-231S. doi: 10.3945/an.115.008706
- Johnson, B. J., Bell, L. K., Zarnowiecki, D., Rangan, A. M., & Golley, R. K. (2017). Contribution of Discretionary Foods and Drinks to Australian Children's Intake of Energy, Saturated Fat, Added Sugars and Salt. *Children (Basel, Switzerland)*, 4(12), 104. doi: 10.3390/children4120104
- Johnston, C. A., Moreno, J. P., El-Mubasher, A., & Woehler, D. (2012). School lunches and lunches brought from home: a comparative analysis. *Child Obes*, 8(4), 364-368. doi: 10.1089/chi.2012.0012
- Jones, J., Wyse, R., Finch, M., Lecathelinais, C., Wiggers, J., Marshall, J., ... & Fielding, A. (2015). Effectiveness of an intervention to facilitate the implementation of healthy eating and physical activity policies and practices in childcare services: a randomised controlled trial. *Implementation Science*, 10(1), 147.. doi: 10.1186/s13012-015-0340-z.
- Jones, J., Yoong, S., Wyse, R., Ward, D. S., & Wolfenden, L. (2017). Improving the impact of obesity prevention interventions in the childcare setting: The need for a systematic application of implementation science. *J Paediatr Child Health* 53(3): 211-213.
- Jones, J., Wyse, R., Wiggers, J., Yoong, S. L., Finch, M., Lecathelinais, C., . . . Wolfenden, L. (2017). Dietary intake and physical activity levels of children attending Australian childcare services. *Nutr Diet*, 74(5), 446-453. doi: 10.1111/1747-0080.12375
- Joyce, A., Green, C., Carey, G., & Malbon, E. (2018). The 'Practice Entrepreneur' - An Australian case study of a systems thinking inspired health promotion initiative. *Health Promot Int*, 33(4), 589-599. doi: 10.1093/heapro/daw102



- Kaikkonen, J. E., Mikkilä, V., Magnussen, C. G., Juonala, M., Viikari, J. S., & Raitakari, O. T. (2013). Does childhood nutrition influence adult cardiovascular disease risk?--insights from the Young Finns Study. *Ann Med*, *45*(2), 120-128. doi: 10.3109/07853890.2012.671537
- Keaver, L., Webber, L., Dee, A., Shiely, F., Marsh, T., Balanda, K., & Perry, I. (2013). Application of the UK foresight obesity model in Ireland: the health and economic consequences of projected obesity trends in Ireland. *PLoS One*, *8*(11).
- Kelly, B., Hardy, L.L., Howlett, S., King, L., Farrell, L., Hattersley, L. (2010). Opening Australian preschoolers' lunchboxes. *Aust. N. Z. J. Public Health*, *34*:288.-92 doi: 10.1111/j.1753-6405.2010.00528.x.
- Kennedy, S. (2016). Public shifting its views on health care issues; Poll respondents are more accepting of government role, less likely to view obesity as a personal failing. *Morning Call*.
- Kent, G. (1994). The roles of international organizations in advancing nutrition rights. *Food Policy*, *19*(4), 357-366.
- King, L., Turnour, C., & Wise, M. (2007). Analysing NSW state policy for child obesity prevention: Strategic policy versus practical action. *Australia and New Zealand Health Policy*, *4*(1), 22.
- Kivunja, C., & Kuyini, A. B. (2017). Understanding and Applying Research Paradigms in Educational Contexts. *International Journal of Higher Education*, *6*(5), 26-41.
- Koch, L. C., Niesz, T., & McCarthy, H. (2014). Understanding and Reporting Qualitative Research: An Analytical Review and Recommendations for Submitting Authors. *Rehabilitation Counseling Bulletin*, *57*(3), 131-143. doi: 10.1177/0034355213502549
- Kondrup, J. (2004) Proper hospital nutrition as a human right. *Clin Nutr* *23*, 135-137.
- Kuczmariski, M. F., & Fieldhouse, P. (1998). Food and Nutrition--Customs and Culture (2nd edn). *Social Science and Medicine*, *47*(2), 284-284.
- Kyu, H. H., Abate, D., Abate, K. H., Abay, S. M., Abbafati, C., Abbasi, N., . . . Murray, C. J. L. (2018). Global, regional, and national disability-adjusted life-years (DALYs) for 359 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, *392*(10159), 1859-1922. doi: [https://doi.org/10.1016/S0140-6736\(18\)32335-3](https://doi.org/10.1016/S0140-6736(18)32335-3)
- Lafraire, J., Rioux, C., Giboreau, A., & Picard, D. (2016). Food rejections in children: Cognitive and social/environmental factors involved in food neophobia and picky/fussy eating behavior. *Appetite* *96*: 347-357.
- Lancet, T. (2016). UK Government won't step up to the plate on childhood obesity. *The Lancet* *388*(10047): 841.
- Lang, T. & Barling, D. (2013). Nutrition and sustainability: an emerging food policy discourse. *Proc Nutr Soc* *72*(1): 1-12.
- Lang, T. & Rayner, G. (2012). Ecological public health: the 21st century's big idea? An essay by Tim Lang and Geof Rayner. *BMJ* *345*: e5466.

- Langford, R., Bonell, C. P., Jones, H. E., Poulou, T., Murphy, S. M., Waters, E., . . . Campbell, R. (2014). The WHO Health Promoting School framework for improving the health and well-being of students and their academic achievement. *Cochrane Database Syst Rev*(4), CD008958. doi: 10.1002/14651858.CD008958.pub2
- Lanigan, J. D. (2012). The relationship between practices and child care providers' beliefs related to child feeding and obesity prevention. *J Nutr Educ Behav*, 44(6), 521-529. doi: 10.1016/j.jneb.2011.07.008
- Larson, N., Ward, D. S., Neelon, S., & Story, M. (2011). What role can child-care settings play in obesity prevention? A review of the evidence and call for research efforts. *J Am Diet Assoc* 111(9): 1343-1362.
- Lee, J. M., Pilli, S., Gebremariam, A., Keirns, C. C., Davis, M. M., Vijan, S., ... & Gurney, J. G. (2010). Getting heavier, younger: trajectories of obesity over the life course. *International Journal of Obesity*, 34(4), 614-623.
- Liamputtong, P. (2013). *Qualitative research methods Fourth Edition*. Melbourne: Oxford university press.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 75). Sage Publications Ltd.
- Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2011). Paradigmatic controversies, contradictions, and emerging confluences revisited. *The Sage handbook of qualitative research*, 4, 97-128.
- Libbey, H. P., M. T. Story, D. R. Neumark-Sztainer & Boutelle, K. N. (2008). Teasing, disordered eating behaviors, and psychological morbidities among overweight adolescents. *Obesity (Silver Spring)* 16 Suppl 2: S24-29.
- Lindsay, J. (2010). Healthy living guidelines and the disconnect with everyday life. *Critical Public Health* 20(4): 475-487.
- Ling, J., Robbins, L. B., & Wen, F. (2016). Interventions to prevent and manage overweight or obesity in preschool children: A systematic review. *Int J Nurs Stud*, 53, 270-289. doi: 10.1016/j.ijnurstu.2015.10.017
- Lloyd-Williams, F., Bristow, K., Capewell, S., & Mwatsama, M. (2011). Young children's food in Liverpool day-care settings: a qualitative study of pre-school nutrition policy and practice. *Public Health Nutr*, 14(10), 1858-1866. doi: 10.1017/s1368980011000619
- Lobstein, T. (2006). Commentary: obesity--public health crisis, moral panic or a human rights issue? *Int J Epidemiol* 35(1): 74-76; discussion 81-72.
- Louie, J. C. Y. & Tapsell, L.C. (2015). Intake of total and added sugars and nutrient dilution in Australian children and adolescents. *British Journal of Nutrition* 114(11): 1875-1886.
- Lucas, P. J., Patterson, E., Sacks, G., Billich, N., & Evans, C. E. L. (2017). Preschool and school meal policies: an overview of what we know about regulation, implementation, and impact on diet in the UK, Sweden, and Australia. *Nutrients*, 9(7), 736.

- Lyn, R., Evers, S., Davis, J., Maalouf, J., & Griffin, M. (2014). Barriers and Supports to Implementing a Nutrition and Physical Activity Intervention in Child Care: Directors' Perspectives. *J Nutr Educ Behav*, 46(3), 171-180. doi: <http://dx.doi.org/10.1016/j.jneb.2013.11.003>
- Lynagh, M., K. Cliff & Morgan, P.J. (2015). Attitudes and Beliefs of Nonspecialist and Specialist Trainee Health and Physical Education Teachers Toward Obese Children: Evidence for "Anti-Fat" Bias. *J Sch Health* 85(9): 595-603.
- Lynch, M. (2015). Kindergarten food familiarization. An exploratory study of teachers' perspectives on food and nutrition in kindergartens. *Appetite*, 87, 46-55. doi: 10.1016/j.appet.2014.12.200
- Lynch, M., & Batal, M. (2011). Factors Influencing Childcare Providers' Food and Mealtime Decisions: An Ecological Approach. *Child Care in Practice*, 17(2), 185-203. doi: 10.1080/13575279.2010.541424
- Lynch, M., & Batal, M. (2012). Child Care Providers' Strategies for Supporting Healthy Eating: A Qualitative Approach. *Journal of Research in Childhood Education*, 26(1), 107-121. doi: 10.1080/02568543.2011.632069
- Macdonald, J., D. Raphael, R. Labonte, R. Colman, R. Torgerson & Hayward, C. (2009). Income and health in Canada: Canadian researchers' conceptualizations make policy change unlikely. *Int J Health Serv* 39(3): 525-543.
- Micha, R., Karageorgou, D., Bakogianni, I., Trichia, E., Whitsel, L. P., Story, M., Peñalvo, J. L., & Mozaffarian, D. (2018). Effectiveness of school food environment policies on children's dietary behaviors: A systematic review and meta-analysis. *PloS one*, 13(3), e0194555. <https://doi.org/10.1371/journal.pone.0194555>
- Mucavele, P., Sharp, L., Wall, C., & Nicholas, J. (2014). Children's Food Trust'Eat Better, Start Better'programme: outcomes and recommendations. *Perspectives in Public Health*, 134(2), 68.
- Malterud, K. (2001). Qualitative research: standards, challenges, and guidelines. *The Lancet*, 358(9280), 483-488. doi: [http://dx.doi.org/10.1016/S0140-6736\(01\)05627-6](http://dx.doi.org/10.1016/S0140-6736(01)05627-6)
- Mariner, W. K. & Annas, G.J. (2013). Limiting "sugary drinks" to reduce obesity--who decides? *N Engl J Med* 368(19): 1763-1765.
- Matwiejczyk, L., McWhinnie, J. A., & Colmer, K. (2007). An evaluation of a nutrition intervention at childcare centres in South Australia. *Health Promot J Austr*, 18(2), 159-162.
- Matwiejczyk, L., Mehta, K., Scott, J., Tonkin, E., & Coveney, J. (2018). Characteristics of Effective Interventions Promoting Healthy Eating for Pre-Schoolers in Childcare Settings: An Umbrella Review. *Nutrients*, 10(3), 293.
- Matwiejczyk, L., Mehta, K., & Coveney, J. (2019). Factors influencing food service provision decisions in centre-based early childhood education and care services: Cooks' perspective. *Health Promotion Journal of Australia* <https://doi-org.ezproxy.flinders.edu.au/10.1002/hpja.308>
- Matwiejczyk, L., Roberts, R., Farrer, O., O'Dea, G., Bevan, G., Nairn, L., & Miller, M. (2018). Engaging food service providers to change food service practices in aged care facilities. *Nutrition & Dietetics*, 75(4), 381-389.

- Mayes, R. & Oliver, T.R. (2012). Chronic disease and the shifting focus of public health: is prevention still a political lightweight? *J Health Polit Policy Law* 37(2): 181-200.
- Mazarello Paes, V., Ong, K. K., & Lakshman, R. (2015). Factors influencing obesogenic dietary intake in young children (0–6 years): systematic review of qualitative evidence. *BMJ Open*, 5(9). doi: 10.1136/bmjopen-2014-007396
- McKay, K. & Nigro, R. (2017). Policy at play: The implementation of Healthy Eating and Active Living Guidelines in municipal childcare settings. *Can J Public Health* 107(6): e556-e561.
- McSweeney, L. A., T. Rapley, C. D. Summerbell, C. A. Houghton & Adamson, A.J. (2016). Perceptions of nursery staff and parent views of healthy eating promotion in preschool settings: an exploratory qualitative study. *BMC Public Health* 16(1): 841.
- Mehta, K., Booth, S., Coveney, J., & Strazdins, L. (2019). Feeding the Australian family: challenges for mothers, nutrition and equity. *Health Promot Int*. doi: 10.1093/heapro/daz061
- Mello, M. M., D. M. Studdert & Brennan, T.A. (2006). Obesity — The New Frontier of Public Health Law. *New England Journal of Medicine* 354(24): 2601-2610.
- Mercer, J. G., A. M. Johnstone & Halford, J.C. (2015). Approaches to influencing food choice across the age groups: from children to the elderly. *Proc Nutr Soc*: 1-9.
- Merritt, A. (2007). E. Satter Your Child's Weight: Helping without Harming, Kelcy Press *Journal of Nutrition Education and Behavior*, 39(5), S197-S198.
- Mertens, D. M. (2010). Transformative mixed methods research. *Qualitative inquiry*, 16(6), 469-474.
- Mikkelsen, B. E. (2013). Can healthy eating at school be considered a human right?. In *The Ethics of Consumption* (pp. 412-416). Wageningen Academic Publishers, Wageningen. [https://doi.org/10.3920/978-90-8686-784-4\\_66](https://doi.org/10.3920/978-90-8686-784-4_66)
- Mikkelsen, B. E., Engesveen, K., Afflerbach, T., & Barnekow, V. (2016). The human rights framework, the school and healthier eating among young people: a European perspective. *Public Health Nutrition*, 19(1), 15-25.
- Mikkelsen, M. V., S. Husby, L. R. Skov & Perez-Cueto, F.J. (2014). A systematic review of types of healthy eating interventions in preschools. *Nutr J* 13: 56.
- Mikkila, V., L. Rasanen, O. T. Raitakari, P. Pietinen & Viikari, J. (2005). Consistent dietary patterns identified from childhood to adulthood: the cardiovascular risk in Young Finns Study. *Br J Nutr* 93(6): 923-931.
- Miller, J., Chan, L., Mehta, K., Roberts, R., Dickinson, K. M., Yaxley, A., . . . Miller, M. (2016). Dietary intake of working women with children does not appear to be influenced by hours of employment: A secondary analysis of the Australian Health Survey (2011–2013). *Appetite*, 105, 106-113. doi: <http://dx.doi.org/10.1016/j.appet.2016.05.007>
- Miller, M., Hamilton, J., Scupham, R., Matwiejczyk, L., Prichard, I., Farrer, O., & Yaxley, A. (2018). Development and psychometric testing of a novel food service satisfaction questionnaire for

- food service staff of aged care homes. *The journal of nutrition, health & aging*, 22(2), 205-215.
- Miyawaki, A., Lee, J., Kobayashi, Y. (2019). Impact of the school lunch program on overweight and obesity among junior high school students: a nationwide study in Japan. *Journal of Public Health*, 41(2), 362–370. doi:10.1093/pubmed/fdy095
- Moffat, T., & Thrasher, D. (2016). School meal programs and their potential to operate as school-based obesity prevention and nutrition interventions: Case studies from France and Japan. *Critical Public Health*, 26(2), 133-146.
- Molloy, C. J., J. Kearney, N. Hayes, C. G. Slattery & Corish, C. (2014). Healthy incentive scheme in the Irish full-day-care pre-school setting. *Proceedings of the Nutrition Society* 73(1): 147-158.
- Monasta, L., G. D. Batty, A. Macaluso, L. Ronfani, V. Lutje, A. Bavcar, F. J. van Lenthe, J. Brug & Cattaneo, A. (2011). Interventions for the prevention of overweight and obesity in preschool children: a systematic review of randomized controlled trials. *Obesity Reviews* 12(5): e107-e118.
- Moore, H., Nelson, P., Marshall, J., Cooper, M., Zambas, H., Brewster, K., & Atkin, K. (2005). Laying foundations for health: food provision for under 5s in day care. *Appetite*, 44(2), 207-213. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med5&NEWS=N&AN=15808895>
- Morley, B., Martin, J., Niven, P., & Wakefield, M. (2012). Public opinion on food-related obesity prevention policy initiatives. *Health Promot J Austr* 23(2): 86-91.
- Morris, H., Skouteris, H., Edwards, S., & Rutherford, L. (2014). Obesity prevention interventions in early childhood education and care settings with parental involvement: a systematic review. *Early Child Development and Care*, 185(8), 1283-1313. doi: 10.1080/03004430.2014.991723
- Mortlock, A. (2015). Toddlers' use of peer rituals at mealtime: symbols of togetherness and otherness. *International Journal of Early Years Education*, 23(4), 426-435. doi: 10.1080/09669760.2015.1096237
- Namenek Brouwer, R. J., & Benjamin Neelon, S. E. (2013). Watch me grow: a garden-based pilot intervention to increase vegetable and fruit intake in preschoolers. *BMC Public Health*, 13, 363. doi: 10.1186/1471-2458-13-363
- Namey, E., Guest, G., McKenna, K., & Chen, M. (2016). Evaluating Bang for the Buck: A Cost-Effectiveness Comparison Between Individual Interviews and Focus Groups Based on Thematic Saturation Levels. *American Journal of Evaluation*, 37(3), 425-440. doi: 10.1177/1098214016630406
- Nathan, N., Janssen, L., Sutherland, R., Hodder, R. K., Evans, C. E. L., Booth, D., . . . Wolfenden, L. (2019). The effectiveness of lunchbox interventions on improving the foods and beverages packed and consumed by children at centre-based care or school: a systematic review and meta-analysis. *Int J Behav Nutr Phys Act*, 16(1), 38. doi: 10.1186/s12966-019-0798-1
- Nekitsing, C., Hetherington, M.M. & Blundell-Birtill, P. Developing Healthy Food Preferences in

Preschool Children Through Taste Exposure, Sensory Learning, and Nutrition Education. *Curr Obes Rep* 7, 60–67 (2018). <https://doi.org/10.1007/s13679-018-0297-8>

Newman, L., Ludford, I., Williams, C., & Herriot, M. (2016). Applying health in all policies to obesity in South Australia. *Health promotion international*, 31(1), 44-58.

Ng, M., T. Fleming, M. Robinson, B. Thomson, N. Graetz, C. Margono, E. C. Mullany, S. Biryukov, C. Abbafati, S. F. Abera, J. P. Abraham, N. M. Abu-Rmeileh, T. Achoki, F. S. AlBuhairan, Z. A. Alemu, R. Alfonso, M. K. Ali, R. Ali, N. A. Guzman, W. Ammar, P. Anwari, A. Banerjee, S. Barquera, S. Basu, D. A. Bennett, Z. Bhutta, J. Blore, N. Cabral, I. C. Nonato, J. C. Chang, R. Chowdhury, K. J. Courville, M. H. Criqui, D. K. Cundiff, K. C. Dabhadkar, L. Dandona, A. Davis, A. Dayama, S. D. Dharmaratne, E. L. Ding, A. M. Durrani, A. Esteghamati, F. Farzadfar, D. F. Fay, V. L. Feigin, A. Flaxman, M. H. Forouzanfar, A. Goto, M. A. Green, R. Gupta, N. Hafezi-Nejad, G. J. Hankey, H. C. Harewood, R. Havmoeller, S. Hay, L. Hernandez, A. Hussein, B. T. Idrisov, N. Ikeda, F. Islami, E. Jahangir, S. K. Jassal, S. H. Jee, M. Jeffreys, J. B. Jonas, E. K. Kabagambe, S. E. Khalifa, A. P. Kengne, Y. S. Khader, Y. H. Khang, D. Kim, R. W. Kimokoti, J. M. Kinge, Y. Kokubo, S. Kosen, G. Kwan, T. Lai, M. Leinsalu, Y. Li, X. Liang, S. Liu, G. Logroscino, P. A. Lotufo, Y. Lu, J. Ma, N. K. Mainoo, G. A. Mensah, T. R. Merriman, A. H. Mokdad, J. Moschandreas, M. Naghavi, A. Naheed, D. Nand, K. M. Narayan, E. L. Nelson, M. L. Neuhouser, M. I. Nisar, T. Ohkubo, S. O. Oti, A. Pedroza, D. Prabhakaran, N. Roy, U. Sampson, H. Seo, S. G. Sepanlou, K. Shibuya, R. Shiri, I. Shiue, G. M. Singh, J. A. Singh, V. Skirbekk, N. J. Stapelberg, L. Sturua, B. L. Sykes, M. Tobias, B. X. Tran, L. Trasande, H. Toyoshima, S. van de Vijver, T. J. Vasankari, J. L. Veerman, G. Velasquez-Melendez, V. V. Vlassov, S. E. Vollset, T. Vos, C. Wang, S. X. Wang, E. Weiderpass, A. Werdecker, J. L. Wright, Y. C. Yang, H. Yatsuya, J. Yoon, S. J. Yoon, Y. Zhao, M. Zhou, S. Zhu, A. D. Lopez, C. J. Murray and E. Gakidou (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, 384(9945), 766-781.

Nicklaus, S., Boggio, V., Chabanet, C., & Issanchou, S. (2005). A prospective study of food variety seeking in childhood, adolescence and early adult life. *Appetite*, 44(3), 289-297. doi: 10.1016/j.appet.2005.01.006

Nicklaus, S. (2009). Development of food variety in children. *Appetite* 52(1): 253-255.

NHMRC. (2013). *Australian Dietary Guidelines*. Canberra: National Health and Medical Research Council.

Niesz, T., Koch, L., & Rumrill, P. D. (2008). The empowerment of people with disabilities through qualitative research. *Work*, 31(1), 113-125.

Nixon, C. A., Moore, H. J., Douthwaite, W., Gibson, E. L., Vogeles, C., Kreichauf, S., . . . ToyBox-study. (2012). Identifying effective behavioural models and behaviour change strategies underpinning preschool- and school-based obesity prevention interventions aimed at 4–6-year-olds: a systematic review. *Obesity Reviews*, 13, 106-117. doi: 10.1111/j.1467-789X.2011.00962.x

Noble, H., & Mitchell, G. (2016). Research made simple: What is grounded theory?. *Evidence-Based Nursing*, 19(2), 34-35. <https://doi.org/10.1136/eb-2016-102306>

Novak, J. (2009). Australia's Nanny State Manifesto. *Review - Institute of Public Affairs* 61(1): 18-19.

- Novak, N. L. & Brownell, K.D. (2012). Role of Policy and Government in the Obesity Epidemic. *Circulation* 126(19): 2345-2352.
- NSW Ministry of Health (2013) *Healthy Eating and Active Living Strategy: Preventing overweight and obesity in New South Wales 2013-2018*. NSW Ministry of Health  
<https://www.health.nsw.gov.au/heal/Publications/nsw-healthy-eating-strategy.pdf>
- NT Dept Health (2015) *Health Nutrition and Physical Activity Strategy 2015–2020* Northern Territory Government p 1-55  
<https://digitallibrary.health.nt.gov.au/prodjspu/bitstream/10137/672/1/NT%20Health%20Nutrition%20and%20Physical%20Activity%20Strategy%202015%20-%202020.pdf>
- Office of the United Nations High Commissioner for Human Rights (2015), *The Right to Health* Fact Sheet No. 31, p. 1-41 <https://www.ohchr.org/Documents/Publications/Factsheet31.pdf>
- Osowski, C. P., Lindroos, A. K., Barbieri, H. E., & Becker, W. (2015). The contribution of school meals to energy and nutrient intake of Swedish children in relation to dietary guidelines. *Food & Nutrition Research*, 59(1), 27563. <https://doi.org/10.3402/fnr.v59.27563>
- O'Brien, C. B., Harris, B. I., Beckman, J. T., Reed, A. D., & Cook, A. D. (2014). Standards for Reporting Qualitative Research: A Synthesis of Recommendations. *Academic Medicine*, 89(9), 1245-1251. doi: 10.1097/ACM.0000000000000388
- OECD. (2019). *Education at a Glance 2019*. doi:<https://doi.org/10.1787/f8d7880d-en>
- Olds, T. S., Tomkinson, G.R., Ferrar, K., & Maher, C. (2009). Trends in the prevalence of childhood overweight and obesity in Australia between 1985 and 2008. *Int J Obes* 34(1): 57-66.
- Olds T, Maher C, Zumin S, et al. Evidence that the prevalence of childhood overweight is plateauing: data from nine countries. *Pediatr Obes* 2011; 6: 342–360.
- Os, E (2019). Engaging toddlers in interactions during meals: group-related joint attention. *Nordisk Barnehegeforskning*, 18. doi: 10.7577/nbf.2692
- Osowski, C. P., Göransson, H., & Fjellström, C. (2013). Teachers' interaction with children in the school meal situation: The example of pedagogic meals in Sweden. *Journal of nutrition education and behavior*, 45(5), 420-427.
- Otten, J., Hirsch, T., & Lim, C. (2017). Factors Influencing the Food Purchases of Early Care and Education Providers. *Journal of the Academy of Nutrition and Dietetics*, 117(5), 725-734.
- Pagnini, D., R. Wilkenfeld, L. King, M. Booth & Booth, S. (2007). Early childhood sector staff perceptions of child overweight and obesity: the Weight of Opinion Study. *Health Promotion Journal of Australia* 18(2): 149-154.
- Park, M. H., U. Sovio, R. M. Viner, R. J. Hardy & Kinra, S (2013). Overweight in childhood, adolescence and adulthood and cardiovascular risk in later life: pooled analysis of three british birth cohorts. *PLoS One* 8(7): e70684.

- Patterson, E., Quetel, A. K., Lilja, K., Simma, M., Olsson, L., & Elinder, L. S. (2013). Design, testing and validation of an innovative web-based instrument to evaluate school meal quality. *Public Health Nutrition*, 16(6), 1028-1036.
- Patterson, E.; Elinder, L.S. (2015). Improvements in school meal quality in Sweden after the introduction of new legislation—a 2-year follow-up. *Eur. J. Public Health*, 25, 655–660.
- Patrick, H., & Nicklas, T. A. (2005). A review of family and social determinants of children's eating patterns and diet quality. *J Am Coll Nutr*, 24(2), 83-92. doi: 10.1080/07315724.2005.10719448
- Patterson, E., & Elinder, L. S. (2015). Improvements in school meal quality in Sweden after the introduction of new legislation—a 2-year follow-up. *The European Journal of Public Health*, 25(4), 655-660.
- Patton, M. Q. (2002). Two decades of developments in qualitative inquiry: A personal, experiential perspective. *Qualitative Social Work*, 1(3), 261-283.
- Pearson, N., & Biddle, S. J. (2011). Sedentary behavior and dietary intake in children, adolescents, and adults. A systematic review. *Am J Prev Med*, 41(2), 178-188. doi: 10.1016/j.amepre.2011.05.002
- Penm, E. (2008). *Cardiovascular disease and its associated risk factors in Aboriginal and Torres Strait Islander peoples 2004–05*. Cardiovascular disease series no. 29. Cat. no. CVD 41. Canberra:AIHW.
- Peters, J., Parletta, N., Campbell, K., & Lynch, J. (2014). Parental influences on the diets of 2- to 5-year-old children: Systematic review of qualitative research. *Journal of Early Childhood Research*, 12(1), 3-19. doi: 10.1177/1476718x13492940
- Peters, J., Parletta, N., Lynch, J., & Campbell, K. (2014). A comparison of parental views of their pre-school children's 'healthy' versus 'unhealthy' diets. A qualitative study. *Appetite* 76: 129-136.
- Peterson S. (2009). The Lunch Box Program- Packing healthy take-along lunches for preschool children. *USDA Land-Grant Success Stories in Competency Training. Cooperative State Research, Education and Extension Service*.  
<http://www.uwex.edu/ces/wnep/teach/lunchbox.cfm>.
- Pigeon, N., Henwood, K., Hardy, M., & Bryman, A. (2004). Grounded theory. *Handbook of Data Analysis*, 625-648.
- Pollard, C., J. Lewis & Miller, M. (2001). Start Right Eat Right award scheme: implementing food and nutrition policy in childcare centers. *Health Educ Behav* 28(3): 320-330.
- Prentice-Dunn, & Prentice-Dunn, S. (2012). Physical activity, sedentary behavior, and childhood obesity: a review of cross-sectional studies. *Psychol Health Med* 17(3): 255-273.
- Priest, N., B. Swinburn & Waters, E. (2010). A human rights approach to childhood obesity prevention. *Preventing Childhood Obesity*, Wiley-Blackwell: 40-45.
- Productivity Commission (2015). *Productivity Commission 2014, Childcare and Early Childhood Learning: Overview*, Inquiry Report No. 73, Canberra.



- Productivity Commission (2018). *Report on Government Services 2018, Chapter 3, Early Childhood and Care*, pp 3.31-3.35 Canberra. <https://www.pc.gov.au/research/ongoing/report-on-government-services/2018/child-care-education-and-training>
- Public Health Association of Australia. (2018), *National Nutrition Strategy background paper*, Deakin. 1-13. <https://www.phaa.net.au/documents/item/2870>
- Puhl R. & King M. (2013). Weight discrimination and bullying. *Best Practice & Research Clinical Endocrinology & Metabolism*, 27(2), 117-127. doi: <http://dx.doi.org/10.1016/j.beem.2012.12.002>
- Purcell, M. (2010). Raising healthy children: Moral and political responsibility for childhood obesity.. *Journal of Public Health Policy* 31(4): 433-446.
- Queensland Health (2010). *The Health of Queenslanders 2010. Third Report of the Chief Health Officer Queensland*. Brisbane 2010.: 1-183.
- Ramsay, S., Branen, L., Fletcher, J., & Holyoke, L. (2010). Childcare Providers Stated Concerns With Letting Children Serve Themselves. *J Nutr Educ Behav*, 42(4, Supplement), S89. doi: <https://doi.org/10.1016/j.jneb.2010.03.051>
- Ramsay, S. A., Branen, L. J., Fletcher, J., Price, E., Johnson, S. L., & Sigman-Grant, M. (2010). "Are you done?" Childcare Providers' Verbal Communication at Mealtimes That Reinforce or Hinder Children's Internal Cues of Hunger and Satiation. *J Nutr Educ Behav*, 42(4), 265-270. doi: <https://doi.org/10.1016/j.jneb.2009.07.002>
- Raphael, D. (2008). Shaping public policy and population health in the United States: why is the public health community missing in action?. *Int J Health Serv* 38(1): 63-94.
- Raphael, D. (2015). Beyond policy analysis: the raw politics behind opposition to healthy public policy. *Health Promot Int* 30(2): 380-396.
- Rasbold, A. H., Adamec, R., Anderson, M. P., Campbell, J. E., Horm, D. M., Sitton, L. K., & Sisson, S. B. (2016). Macronutrient and micronutrient intakes of children in Oklahoma child-care centres, USA. *Public health nutrition*, 19(8), 1498-1505.
- Raubenheimer, D. & Simpson, S.J. (2016). Nutritional Ecology and Human Health. *Annu Rev Nutr* 36: 603-626.
- Rawshani, A., Svensson, A. M., Zethelius, B., Eliasson, B., Rosengren, A., & Gudbjörnsdottir, S. (2016). Association between socioeconomic status and mortality, cardiovascular disease, and cancer in patients with type 2 diabetes. *JAMA internal medicine*, 176(8), 1146-1154.
- Ray, C., S. Maatta, R. Lehto, G. Roos & Roos, E. (2016). Influencing factors of children's fruit, vegetable and sugar-enriched food intake in a Finnish preschool setting - Preschool personnel's perceptions. *Appetite* 103: 72-79.
- Reilly, J. J. (2006). Obesity in childhood and adolescence: evidence based clinical and public health perspectives. *Postgrad Med J* 82(969): 429-437.
- Reilly, J. J., E. Methven, Z. C. McDowell, B. Hacking, D. Alexander, L. Stewart & Kelnar, C.J. (2003). Health consequences of obesity. *Arch Dis Child* 88(9): 748-752.

- Robson, S. M., Khoury, J. C., Kalkwarf, H. J., & Copeland, K. (2015). Dietary Intake of Children Attending Full-time Child Care: What are they eating away from the Child-Care Center? *J Acad Nutr Diet*, 115(9), 1472-1478. doi: 10.1016/j.jand.2015.02.029
- Robinson, E., A. Haynes, A. R. Sutin & Daly, M. (2017). Telling people they are overweight: helpful, harmful or beside the point? *Int J Obes (Lond)* 41(8): 1160-1161.
- Romo-Palafox, M.J., Ranjit, N., Sweitzer, S.J., Roberts-Gray, C., Holescher, D.M., Byrd-Williams, C.E. (2015). Dietary quality of preschoolers' sack lunches as measured by the Healthy Eating Index. *J Acad Nutr Diet*, 115(11):1779.-1788 doi: 10.1016/j.jand.2015.05.017.
- Rupsiene, L., & Pranskuniene, R. (2010). The variety of grounded theory: Different versions of the same method or different methods. *Socialiniai mokslai*, 4(70), 7-20.
- Russell-Mayhew, S., G. McVey, A. Bardick & Ireland, A. (2012). Mental health, wellness, and childhood overweight/obesity. *J Obes* 2012: 281801.
- Rutz, J. C. (2017). *Farm to Child Care: An Analysis of Social and Economic Values in Local Food Systems*. *Journal of Agriculture, Food Systems, and Community Development*, 8(3), 23-39. <https://doi.org/10.5304/jafscd.2018.083.004>
- Sabin, M. A., K.-T. Kao, M. Juonala, L. A. Baur & Wake, M. (2015). Viewpoint article: Childhood obesity – looking back over 50 years to begin to look forward. *Journal of Paediatrics and Child Health* 51(1): 82-86.
- Sabin, M. A. & Kiess, W. (2015). Childhood obesity: Current and novel approaches. *Best Practice & Research Clinical Endocrinology & Metabolism* 29(3): 327-338.
- Sabinsky, M., Toft, U., Sommer, H., & Tetens, I. (2019). Effect of implementing school meals compared with packed lunches on quality of dietary intake among children aged 7–13 years. *Journal of Nutritional Science*, 8(3). doi:10.1017/jns.2018.29
- Sacks, G., B. Swinburn & Lawrence, M. (2009). Obesity Policy Action framework and analysis grids for a comprehensive policy approach to reducing obesity. *Obesity Reviews* 10(1): 76-86.
- Sacks, G., B. A. Swinburn & Lawrence, M.A. (2008). A systematic policy approach to changing the food system and physical activity environments to prevent obesity. *Aust New Zealand Health Policy* 5: 13.
- Sacks, Gary (2017): *Executive Summary: Policies for tackling obesity and creating healthier food environments Scorecard and priority recommendations for Australian governments*. The University of Auckland. Journal contribution. <https://doi.org/10.17608/k6.auckland.5673511.v1>
- Safron, M., Cislak, A., Gaspar, T., & Luszczynska, A. (2011). Effects of School-based Interventions Targeting Obesity-Related Behaviors and Body Weight Change: A Systematic Umbrella Review. *Behavioral Medicine*, 37(1), 15-25. doi: 10.1080/08964289.2010.543194
- Sallis, J., Fisher, E., Owen, N. (2008). Ecological Models of Health Behaviour Chapt. 20. In K. Glanz, Rimer, Barbara K., Viswanath, K. (Ed.), *Health behaviour and health education: theory, research, and practice* pp. 465-485.

- Sallis, J. F., & Owen, N. (2015). Ecological models of health behavior. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior: Theory, research, and practice* (p. 43–64). Jossey-Bass.
- Sallis, J. F., Cervero, R. B., Ascher, W., Henderson, K. A., Kraft, M. K., & Kerr, J. (2006). An Ecological Approach to Creating Active Communities *Annual Review of Public Health, 27*, 297-322. doi: 10.1146/annurev.publhealth.27.021405.102100
- Sambell, R., Devine, A., & Lo, J. (2014). Does the food group provision in early years' education and care settings in metropolitan Perth, Western Australia, meet national dietary requirements; and how can Home Economics support this?. *Journal of the Home Economics Institute of Australia, 21*(2), 20.
- Sanders, R. H., A. Han, J. S. Baker & Cobley, S. (2015). Childhood obesity and its physical and psychological co-morbidities: a systematic review of Australian children and adolescents. *European Journal of Pediatrics 174*(6): 715-746.
- Sanderson, K. C. (2014). *Examining Structural Barriers to Health: Moving Beyond Individual Choice and Personal Responsibility*. Doctoral dissertation Doctoral dissertation, Northern Arizona University.
- Sassi, F. e. a. (2009). *The Obesity Epidemic: Analysis of Past and Projected Future Trends in Selected OECD Countries*. OECD Health Working Papers, No. 45, OECD. OECD Publishing.
- Save the Children, H. (2014). *Child Rights Situation Analysis Guidelines*. Save the Children.
- Scaglioni, S., C. Arrizza, F. Vecchi & Tedeschi, S. (2011). Determinants of children's eating behavior. *The American Journal of Clinical Nutrition 94*(6 Suppl): 2006S-2011S.
- Scaglioni, S., De Cosmi, V., Ciappolino, V., Parazzini, F., Brambilla, P., & Agostoni, C. (2018). Factors Influencing Children's Eating Behaviours. *Nutrients, 10*(6), 706. doi: 10.3390/nu10060706
- Schwartz, M. B. & Brownell, K. D. (2007). Actions necessary to prevent childhood obesity: creating the climate for change. *J Law Med Ethics 35*(1): 78-89.
- Seiquer, I., A. Haro, C. Cabrera-Vique, A. Munoz-Hoyos & Galdo, G. (2016). [Nutritional assessment of the menus served in municipal nursery schools in Granada]. *An Pediatr (Barc) 85*(4): 197-203.
- Serdula, M. K., Ivery, D., Coates, R. J., Freedman, D. S., Williamson, D. F., & Byers, T. (1993). Do obese children become obese adults? A review of the literature. *Preventive medicine, 22*(2), 167-177.
- Seward, K. & Wolfenden, L (2016). Multistrategy childcare-based intervention to improve compliance with nutrition guidelines versus usual care in long day care services: a study protocol for a randomised controlled trial. *BMJ Open, 6*(6): e010786.
- Seward, K., Wolfenden, L., Finch, M., Wiggers, J., Wyse, R., Jones, J., & Yoong, S. L. (2017). Improving the implementation of nutrition guidelines in childcare centres improves child dietary intake: findings of a randomised trial of an implementation intervention. *Public Health Nutr, 21*(3), 607-617. doi: 10.1017/S1368980017003366

- Sigman-Grant, M., T. A. Byington, A. R. Lindsay, M. Lu, A. R. Mobley, N. Fitzgerald & Hildebrand, D (2014). Preschoolers can distinguish between healthy and unhealthy foods: the all 4 kids study. *J Nutr Educ Behav* 46(2): 121-127.
- Sigman-Grant, M., Christiansen, E., Fernandez, G., Fletcher, J., Johnson, S. L., Branen, L., & Price, B. A. (2011). Child care provider training and a supportive feeding environment in child care settings in 4 states, 2003. *Prev Chronic Dis*, 8(5), A113.
- Sigman, G. (2010). A child's right to an environment that prevents obesity: ethical Considerations. A child's right to a healthy environment, *Springer New York*. 163-181.
- Shill, J., Mavoa, H., Allender, S., Lawrence, M., Sacks, G., Peeters, A., . . . Swinburn, B. (2012). Government regulation to promote healthy food environments--a view from inside state governments. *Obes Rev*, 13(2), 162-173. doi: 10.1111/j.1467-789X.2011.00937.x
- Shill, J., Mavoa, H., Crammond, B., Loff, B., Peeters, A., Lawrence, M., . . . Swinburn, B. A. (2012). Regulation to create environments conducive to physical activity: understanding the barriers and facilitators at the Australian state government level. *PLoS One*, 7(9), e42831. doi: 10.1371/journal.pone.0042831
- Shloim, N., Edelson, L. R., Martin, N., & Hetherington, M. M. (2015). Parenting Styles, Feeding Styles, Feeding Practices, and Weight Status in 4-12 Year-Old Children: A Systematic Review of the Literature. *Frontiers in psychology*, 6, 1849. <https://doi.org/10.3389/fpsyg.2015.01849>
- Simmonds, M., Llewellyn, A., Owen, C., & Woolacott, N. (2015). Predicting adult obesity from childhood obesity: a systematic review and meta-analysis. *Obesity Reviews*, 17(2), 95-107. doi: 10.1111/obr.12334
- Singh, A. S., C. Mulder, J. W. Twisk, W. van Mechelen & Chinapaw, M.J. (2008). Tracking of childhood overweight into adulthood: a systematic review of the literature. *Obes Rev* 9(5): 474-488.
- Sisson, S. B., J. Li, S. H. Arnold, K. R. Lora, J. A. Stoner, B. DeGrace, J. E. Campbell, D. Horm & . Stephens, L. (2015). Obesogenic Childcare Center Environment and Obesity in Preschool Children. *Journal of the Academy of Nutrition and Dietetics* 115(9, Supplement): A76.
- Sisson, S. B., M. Krampe, K. Anundson & Castle, S. (2016). Obesity prevention and obesogenic behavior interventions in childcare: A systematic review. *Prev Med* 87: 57-69.
- Sisson, S. B., A. C. Kiger, K. C. Anundson, A. H. Rasbold, M. Krampe, J. Campbell, B. DeGrace & Hoffman, L. (2017). Differences in preschool-age children's dietary intake between meals consumed at childcare and at home. *Prev Med Rep* 6: 33-37.
- Sisson, S. B., Smith, C. L., & Cheney, M. (2017). Big impact on small children: child-care providers' perceptions of their role in early childhood healthy lifestyle behaviours. *Child Care in Practice*, 23(2), 162-180. doi: 10.1080/13575279.2017.1299111
- Skinner, J. D., B. R. Carruth, B. Wendy & Ziegler, P.J. (2002). Children's food preferences: a longitudinal analysis. *J Am Diet Assoc* 102(11): 1638-1647.
- Skinner, A. C., S. N. Ravanbakht, J. A. Skelton, E. M. Perrin & Armstrong, S.C. (2018). Prevalence of obesity and severe obesity in US children, 1999–2016. *Pediatrics* 141(3): e20173459.

- SkolmatSverige, 2019 *What is SkolmatSverige?* <http://www.skolmatsverige.se/in-english>
- Smith, J. A., Herriot, M., Williams, C., Judd, J., Griffiths, K., & Bainbridge, R. (2019). Health promotion: A political imperative. *Health Promotion Journal of Australia*, 30(2), 133.
- Sobal, J. & Bisogni, C.A. (2009). Constructing food choice decisions. *Ann Behav Med* 38 Suppl 1: S37-46.
- Sokol, R., & Fisher, E. (2016). Peer Support for the Hardly Reached: A Systematic Review. *American Journal of Public Health*, 106(7), e1-e8.
- Song, W. O., S. Song, V. Nieves, A. Gonzalez & Crockett, E.J. (2016). Nutritional health attitudes and behaviors and their associations with the risk of overweight/obesity among childcare providers in Michigan Migrant and Seasonal Head Start centers. *BMC Public Health* 16: 648.
- Stacey, F. G., Finch, M., Wolfenden, L., Grady, A., Jessop, K., Wedesweiler, T., . . . Yoong, S. L. (2017). Evidence of the Potential Effectiveness of Centre-Based Childcare Policies and Practices on Child Diet and Physical Activity: Consolidating Evidence from Systematic Reviews of Intervention Trials and Observational Studies. *Current Nutrition Reports*, 6(3), 228-246. doi: 10.1007/s13668-017-0212-z
- Stanaway, J. D., A. Afshin, E. Gakidou, S. S. Lim, D. Abate, K. H. Abate, C. Abbafati, N. Abbasi, H. et al., (2018). Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet* 392(10159): 1923-1994.
- State of Victoria (2019) *Victorian public health and wellbeing plan 2019-2023*.  
<https://www.education.vic.gov.au/Documents/childhood/providers/edcare/veyldframework.pdf>
- State of Victoria (Department of Education and Training) (2016), *Victorian Early Years Learning and Development Framework for children aged birth to eight years* p. 1-44  
<https://www2.health.vic.gov.au/about/publications/policiesandguidelines/victorian-public-health-wellbeing-plan-2019-2023>
- Steenbock, B., C. R. Pischke, J. Schonbach, S. Pottgen & Brand, T. (2015). The effectiveness of primary prevention interventions promoting physical activity and healthy eating in preschool children : A review of reviews. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz* 58(6): 609-619.
- Story, M., K. M. Kaphingst, R. Robinson-O'Brien & Glanz, K. (2008). Creating healthy food and eating environments: policy and environmental approaches. *Annu Rev Public Health* 29: 253-272.
- Summerbell, C. D., Moore, H. J., Vögele, C., Kreichauf, S., Wildgruber, A., Manios, Y., ... & ToyBox-study group. (2012). Evidence-based recommendations for the development of obesity prevention programs targeted at preschool children. *Obesity reviews*, 13, 129-132.
- Suri, H. (2011). Purposeful Sampling in Qualitative Research Synthesis. *Qualitative Research Journal*, 11(2), 63-75. doi: doi:10.3316/QRJ1102063

- Swan, E., Bouwman, L., Hiddink, G. J., Aarts, N., & Koelen, M. (2015). Applying the salutogenic framework to nutrition research and practice. *American Journal of Health Promotion, 30*(2), 71-73.
- Sweetman, C., McGowan, L., Croker, H., & Cooke, L. (2011). Characteristics of Family Mealtimes Affecting Children's Vegetable Consumption and Liking. *J Am Diet Assoc, 111*(2), 269-273. doi: <https://doi.org/10.1016/j.jada.2010.10.050>
- Sweitzer, S.J., Briley, M.E., Roberts-Gray, C., Holescher, D.M., Staskel, D., Almansour, F. (2010). Lunch is in the Bag: Increasing fruits, vegetables and whole grains in sack lunches for preschool-aged children. *J Amer Diet Association, 110*:1058.-64 doi: 10.1016/j.jada.2010.04.010
- Swinburn, B. (2008). Obesity prevention: the role of policies, laws and regulations. *Australia and New Zealand Health Policy 5*(1): 12.
- Swinburn, B. & Egger, P. (2002). Preventive strategies against weight gain and obesity. *Obes Rev 3*(4): 289-301.
- Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med, 29*(6 Pt 1), 563-570. doi: 10.1006/pmed.1999.0585
- Swinburn, B. & Martin, J. (2010) *Why the Preventive Health Agency should ignore the PC on obesity*. <http://www.crikey.com.au/2010/10/28/why-the-preventive-health-agency-should-ignore-the-pc-on-obesity/>
- Swinburn, B. A., Sacks, G., Hall, K. D., McPherson, K., Finegood, D. T., Moodie, M. L., & Gortmaker, S. L. (2011). The global obesity pandemic: shaped by global drivers and local environments. *The Lancet, 378*(9793), 804-814.
- Swinburn, B., G. Sacks, T. Lobstein, N. Rigby, L. A. Baur, K. D. Brownell, T. Gill, J. Seidell & Kumanyika, S (2008). Sydney Principles' for reducing the commercial promotion of foods and beverages to children. *Public Health Nutrition 11*(9): 881-886.
- Swindle, T. M., Patterson, Z., & Boden, C. J. (2017). A qualitative application of the Belsky Model to explore early care and education teachers' mealtime history, beliefs, and interactions. *J Nutr Educ Behav, 49*(7), 568-578 e561. doi: 10.1016/j.jneb.2017.04.025
- Swindle, T., & Phelps, J. (2018). How Does Context Relate to Nutrition Promotion and Mealtime Practice in Early Care and Education Settings? A Qualitative Exploration. *J Acad Nutr Diet, 118*(11), 2081-2093. doi: 10.1016/j.jand.2018.05.003
- Swyden, K., Sisson, S. B., Lora, K., Castle, S., & Copeland, K. A. (2017). Association of childcare arrangement with overweight and obesity in preschool-aged children: a narrative review of literature. *International Journal of Obesity, 41*(1), 1-12.
- Taber DR, Chriqui JF, Powell L, Chaloupka F (2013) Association Between State Laws Governing School Meal Nutrition Content and Student Weight Status: Implications for New USDA School Meal Standards. *JAMA Pediatr. 167*(6):513–519. doi:10.1001/jamapediatrics.2013.399

- Tanner, C., Maher, J., Leahy, D., Lindsay, J., Supski, S., & Wright, J. (2019). 'Sticky'foods: How school practices produce negative emotions for mothers and children. *Emotion, Space and Society*, 33, 100626.
- Thompson, T.G. (2004) *Statement on preventing chronic disease through healthy lifestyle*. Presented to the United States Senate Committee on Appropriations Subcommittee on Labor, Health and Human Services, Education, July 15, 2004. <https://www.govinfo.gov/content/pkg/CHRG-108shrg96660/html/CHRG-108shrg96660.htm>
- Tikkanen I. (2009). Pupils' school meal diet behaviour in Finland: two clusters. *Br Food J* 111, 223–234.
- Tikkanen, I., & Urho, U. M. (2009). Free school meals, the plate model and food choices in Finland. *British Food Journal*, 111(2), 102-119.
- Tobin, J. (2006). Beyond the supermarket shelf: using a rights based approach to address children's health needs. *The International Journal of Children's Rights* 14(3): 275-306.
- Tong, A., Flemming, K., McInnes, E., Oliver, S., & Craig, J. (2012). Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Medical Research Methodology*, 12(1), 181. doi: 10.1186/1471-2288-12-181
- Tovar, A., A. E. Vaughn, M. Fallon, E. Hennessy, R. Burney, T. Ostbye & Ward, D.S. (2016). Providers' response to child eating behaviors: A direct observation study. *Appetite* 105: 534-541.
- Tovar, A., A. E. Vaughn, A. Grummon, R. Burney, T. Erinosh, T. Ostbye & Ward, D.S. (2017). Family childcare home providers as role models for children: Cause for concern? *Prev Med Rep* 5: 308-313.
- Trost, S. G., L. Messner, K. Fitzgerald & Roths, B. (2009). Nutrition and physical activity policies and practices in family childcare homes. *Am J Prev Med* 37(6): 537-540.
- Thurber, K. A., Dobbins, T., Neeman, T., Banwell, C., & Banks, E. (2017). Body mass index trajectories of Indigenous Australian children and relation to screen time, diet, and demographic factors. *Obesity*, 25(4), 747-756.
- Tysoe, J. & Wilson, C. (2010). Influences of the family and childcare food environments on preschoolers' healthy eating. *Australasian Journal of Early Childhood*; 35(3): 105-114.
- Ulijaszek, S. J., & McLennan, A. K. (2016). Framing obesity in UK policy from the Blair years, 1997–2015: the persistence of individualistic approaches despite overwhelming evidence of societal and economic factors, and the need for collective responsibility. *Obesity Reviews*, 17(5), 397-411.
- UNICEF Office of Research. (2017). *'Building the Future: Children and the Sustainable Development Goals in Rich Countries'*, Innocenti Report Card 14, UNICEF Office of Research – Innocenti, Florence.
- United Nations. (1999). *The Right to Adequate Food, General Comments, 20th Session*. Geneva: Office of the High Commissioner for Human Rights, Committee on Economic, Social and Cultural Rights; available at <https://www.refworld.org/pdfid/4538838c11.pdf>

- United Nations Committee of the Rights of the Child (CRC). (2013). *General comment No. 15 on the rights of the child to the enjoyment to the highest attainment of the standard of health (art. 24)*.
- United Nations General Assembly. (2014a). *Final report: The transformative potential of the right to food* (Report of the Special Rapporteur on the right to food, Olivier De Schutter No. A/HRC/25/57). Geneva: Human Rights Council, United National General Assembly. [http://www.ohchr.org/EN/HRBodies/HRC/RegularSessions/Session25/Documents/A\\_HRC\\_25\\_57\\_ENG.DOC](http://www.ohchr.org/EN/HRBodies/HRC/RegularSessions/Session25/Documents/A_HRC_25_57_ENG.DOC)
- United Nations General Assembly (2014b). *Unhealthy foods, non-communicable diseases and the right to health* (Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Anand Grover No.A/HRC/26/31). Geneva: Human Rights Council, United National General Assembly. [http://www.ohchr.org/EN/HRBodies/HRC/RegularSessions/Session26/Documents/A-HRC-26-31\\_en.doc](http://www.ohchr.org/EN/HRBodies/HRC/RegularSessions/Session26/Documents/A-HRC-26-31_en.doc)
- United Nations. (2014). *Website of the UN Special Rapporteur on the Right to Food*. <http://www.srfood.org/en>
- United Nations Children’s Fund (UNICEF). (2012). *Guidance on Conducting a Situation Analysis of Children’s and Women’s Rights: Taking a rights-based, equity-focused approach to Situation Analysis*. UNICEF.
- United Nations Children’s Fund (UNICEF) Programme Division. (2014). *EU-UNICEF Child Rights Toolkit: Integrating Child Rights in Development Cooperation*. UNICEF.
- United Nations (1989) *Convention on the Rights of the Child*. Geneva: Office of the High Commissioner for Human Rights; <http://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx>
- UNICEF (2019). *The State of the World’s Children 2019.Children, Food and Nutrition: Growing well in a changing world*. UNICEF, New York
- Vaughn, A. E., Ward, D. S., Fisher, J. O., Faith, M. S., Hughes, S. O., Kremers, S. P., Musher-Eizenman, D. R., O’Connor, T. M., Patrick, H., & Power, T. G. (2016). Fundamental constructs in food parenting practices: a content map to guide future research. *Nutrition reviews*, 74(2), 98–117. <https://doi.org/10.1093/nutrit/nuv061>
- van de Kolk, I., Goossens, A., Gerards, S., Kremers, S., Manders, R., & Gubbels, J. (2018). Healthy Nutrition and Physical Activity in Childcare: Views from Childcare Managers, Childcare Workers and Parents on Influential Factors. *Int J Environ Res Public Health*, 15(12), 2909.
- Vandevijvere, S. (2014). Why a Global Convention to Protect and Promote Healthy Diets is timely. *Public Health Nutrition* 17(11): 2387-2388.



- Vandeweghe, L., Moens, E., Braet, C., Van Lippevelde, W., Vervoort, L., & Verbeken, S. (2016). Perceived effective and feasible strategies to promote healthy eating in young children: focus groups with parents, family child care providers and daycare assistants. *BMC Public Health*, *16*(1), 1045.
- Vandeweghe, L., S. Verbeken, E. Moens, L. Vervoort & Braet, C. (2016). Strategies to improve the Willingness to Taste: The moderating role of children's Reward Sensitivity. *Appetite* *103*: 344-352.
- Vidgen, H. A. & Gallegos, D. (2014). Defining food literacy and its components. *Appetite* *76*: 50-59.
- Wallace, R. M., Costello, L. N., & Devine, A. (2017). Over-provision of discretionary foods at childcare dilutes the nutritional quality of diets for children. *Australian and New Zealand Journal of Public Health*, *41*(4), p.447 DOI: <https://doi.org/10.1111/1753-6405.12658>
- Walls, H. L., Magliano, D. J., Stevenson, C. E., Backholer, K., Mannan, H. R., Shaw, J. E., & Peeters, A. (2012). Projected progression of the prevalence of obesity in Australia. *Obesity (Silver Spring)*, *20*(4), 872-878. doi: 10.1038/oby.2010.338
- Wang, X., Y. Ouyang, J. Liu, M. Zhu, G. Zhao, W. Bao & Hu, F.B. (2014). Fruit and vegetable consumption and mortality from all causes, cardiovascular disease, and cancer: systematic review and dose-response meta-analysis of prospective cohort studies. *BMJ* *349*: g4490.
- Wang, Y. C., K. McPherson, T. Marsh, S. L. Gortmaker & Brown, M. (2011). Health and economic burden of the projected obesity trends in the USA and the UK. *The Lancet* *378*(9793): 815-825.
- Ward, S., Bélanger, M., Donovan, D., & Carrier, N. (2015). Childcare Educators' Influence on Physical Activity and Eating Behaviours of Preschool Children: A Systematic Review. *Canadian Journal of Diabetes*, *39*(Supplement 1), S73. doi: <https://doi.org/10.1016/j.jcjd.2015.01.272>
- Ward, S., M. Bélanger, D. Donovan & Carrier, N. (2015). Systematic review of the relationship between childcare educators' practices and preschoolers' physical activity and eating behaviours. *Obesity Reviews* *16*(12): 1055-1070.
- Ward, S., M. Belanger, D. Donovan, A. Horsman & Carrier, N. (2015). Correlates, determinants, and effectiveness of childcare educators' practices and behaviours on preschoolers' physical activity and eating behaviours: a systematic review protocol. *Syst Rev* *4*: 18.
- Ward, S. A., M. F. Bélanger, D. Donovan & Carrier, N. (2016). Relationship between eating behaviors and physical activity of preschoolers and their peers: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity* *13*(1): 50.
- Ward, D. S., E. Welker, A. Choate, K. E. Henderson, M. Lott, A. Tovar, A. Wilson & Sallis, J.F. (2016). Strength of obesity prevention interventions in early care and education settings: A systematic review. *Preventive Medicine*. *95*(SS), S37-S52.
- Wardle, J., & Cooke, L. (2008). Genetic and environmental determinants of children's food preferences. *Br J Nutr* *99* Suppl 1: S15-21.

- Waters, E., A. de Silva-Sanigorski, B. J. Hall, T. Brown, K. J. Campbell, Y. Gao, R. Armstrong, L. Prosser & Summerbell, C.D. (2011). Interventions for preventing obesity in children. *COCHRane Database Syst Rev* (12): CD001871.
- Welker, E., Lott, M. & Story, M. (2016) The School Food Environment and Obesity Prevention: Progress Over the Last Decade. *Current Obesity Report* 5, 145–155. <https://doi.org/10.1007/s13679-016-0204-0>
- Wheaton, N., Millar, L., Allender, S., & Nichols, M. (2015). The stability of weight status through the early to middle childhood years in Australia: a longitudinal study. *BMJ open*, 5(4).
- Whitrow, M. J., L. Moran, M. J. Davies, C. E. Collins, T. L. Burrows, S. Edwards & Moore, V.M. (2016). Core food intakes of Australian children aged 9–10 years: nutrients, daily servings and diet quality in a community cross-sectional sample. *Journal of Human Nutrition and Dietetics* 29(4): 449-457.
- Whiteley, C., & Matwiejczyk, L. (2015). Preschool Program Improves Young Children's Food Literacy and Attitudes to Vegetables. *J Nutr Educ Behav*. doi: 10.1016/j.jneb.2015.04.002
- Wilson, T. (2013). *Health at all costs? How health-first paternalism is promoted by government to corrode choice*. Institute Professionals Association. Pp 1-47. [https://ipa.org.au/wp-content/uploads/archive/131212-PAPER-Healthatallcosts\(2\).pdf](https://ipa.org.au/wp-content/uploads/archive/131212-PAPER-Healthatallcosts(2).pdf)
- Witt, K. E., & Dunn, C. (2012). Increasing fruit and vegetable consumption among preschoolers: evaluation of color me healthy. *J Nutr Educ Behav*, 44(2), 107-113. doi: 10.1016/j.jneb.2011.01.002
- WHO. (2009). *Interventions on diet and physical activity: what works*. Geneva: World Health Organization.
- WHO. (2012). *Prioritizing areas for action in the field of population-based prevention in Childhood Obesity*. Geneva: World Health Organization.
- WHO. (2013). *Global action plan for the prevention and control of noncommunicable diseases 2013*. Geneva: World Health Organization.
- WHO. (2016). *Report of the commission on ending childhood obesity; report of the ad hoc working group on science and evidence for ending childhood obesity*, Geneva, Switzerland.. 2016.
- WHO. (2017). *Report of the Commission on Ending Childhood Obesity Implementation Plan:executive summary*. Geneva: World Health Organization.
- WHO & United Nations Human Rights Office of High Commission. (n.d.). *A human rights-based approach to health*: WHO Department of Ethics, Equity, Trade and Human Rights & United Nations Human Rights and Economic Social Issues Section & Millennium Development Goals Section.
- Wolfenden, L., J. Jones, C. M. Williams, M. Finch, R. J. Wyse, M. Kingsland, F. Tzelepis, J. Wiggers, A.J. Williams, K. Seward, T. Small, V. Welch, D. Booth & Yoong, S.L. (2016). Strategies to improve the implementation of healthy eating, physical activity and obesity prevention policies,

practices or programmes within childcare services. *COCHRane Database Syst Rev* 10: CD011779.

- Wolfenden, L., Wyse, R. J., Britton, B. I., Campbell, K. J., Hodder, R. K., Stacey, F. G., . . . James, E. L. (2012). Interventions for increasing fruit and vegetable consumption in children aged 5 years and under. *COCHRane Database Syst Rev*, 11, CD008552. doi: 10.1002/14651858.CD008552.pub2
- Wu, S., Wyant, D., & Fraser, M. (2016) Author Guidelines for Manuscripts Reporting on Qualitative Research. *J Society Social Work Research* 7 (2), 405- 425.
- Wutzke, S., Morrice, E., Benton, M., Milat, A., Russell, L., & Wilson, A. (2018). Australia's National Partnership Agreement on Preventive Health: critical reflections from states and territories. *Health Promotion Journal of Australia*, 29(3), 228-235.
- Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education*, 48(2), 311-325.
- Yoong, S. L., M. Finch, N. Nathan, J. Wiggers, C. Lecathelinis, J. Jones, P. Dodds & Wolfenden, L. (2016). A longitudinal study assessing childcare services' adoption of obesity prevention policies and practices. *Journal of Paediatrics and Child Health* 52(7): 765-770.
- Yoong, S. L., J. Jones, J. Marshall, J. Wiggers, K. Seward, M. Finch, A. Fielding & Wolfenden, L. (2016). A theory-based evaluation of a dissemination intervention to improve childcare cooks': Intentions to implement nutritional guidelines on their menus. *Implement Sci* 11(1): 105.
- Yoong, S. L., & Williams, C. M. (2015). Childcare service centers' preferences and intentions to use a web-based program to implement healthy eating and physical activity policies and practices: a cross-sectional study. *Journal of Medical Internet Research*, 17(5), e108. doi: 10.2196/jmir.3639
- Yoong, S. L., E. Skelton, J. Jones & Wolfenden, L. (2014). Do childcare services provide foods in line with the 2013 Australian Dietary guidelines? A cross-sectional study. *Aust N Z J Public Health* 38(6): 595-596.
- Yoong, S. L., Grady, A., Seward, K., Finch, M., Wiggers, J., Lecathelinis, C., ... & Wolfenden, L. (2019). The Impact of a Childcare Food Service Intervention on Child Dietary Intake in Care: An Exploratory Cluster Randomized Controlled Trial. *American Journal of Health Promotion*, 33(7), 991-1001.
- Zask, A., Adams, J. K., Brooks, L. O., & Hughes, D. F. (2012). Tooty Fruity Vegie: an obesity prevention intervention evaluation in Australian preschools. *Health Promotion Journal of Australia*, 23(1), 10-15.
- Zhou, Y. E., Emerson, J. S., Levine, R. S., Kihlberg, C. J., & Hull, P. C. (2014). Childhood Obesity Prevention Interventions in Childcare Settings: Systematic Review of Randomized and

Nonrandomized Controlled Trials. *American Journal of Health Promotion*, 28(4), e92-e103.  
doi: 10.4278/ajhp.121129-LIT-579

Zulfiqar, T., Strazdins, L., Banwell, C., Dinh, H., & D'Este, C. (2018). Growing up in Australia: paradox of overweight/obesity in children of immigrants from low-and-middle-income countries. *Obesity science & practice*, 4(2), 178-187.

## 10 Appendices

	Title	Page
Appendix-1	Nutrition-related standards, elements and selected reflective questions from the National Quality Standards for each of the seven Quality Areas (ACECQA 2018)	374
Appendix-2	Sampling grid for selecting centres from which participants were interviewed	379
Appendix-3	Letter of introduction, information sheet and consent form examples	380
Appendix-4	Table S1: Record of search strategies for umbrella review	384
Appendix-5	Table S2: Critical appraisal results for the included reviews using 11 critical appraisal criteria (The Johanna Briggs Institute, 2014)	395
Appendix-6	Table S3: Characteristics of included systematic reviews	396
Appendix-7	Table S4: Summary of the evidence from selected reviews using the Johanna Briggs Institute data extraction checklist (Johanna Briggs Institute 2014)	402
Appendix-8	Codebook example for coding of directors' interviews	413
Appendix-9	Professional development suggestions and other solutions from centre-based personnel	419
Appendix-10	Current nutrition-related programs supporting centre-based childcare services in Australian states and territories	422

**Appendix-1:** Nutrition-related standards, elements and selected reflective questions from the National Quality Standards for each of the seven Quality Areas (ACECQA 2018). (Derived from selected text and reproduced with permission from [ACECQA](https://www.acecqa.com.au) ).

Quality Area (QA) Standard** and element		Descriptor	Selected Reflective Questions*
QA1		Education program and Practice <i>are child-centred, stimulating and maximise opportunities for enhancing and extending each child's learning and development.</i>	
1.1	Program	The educational program enhances each child's learning and development	How do we make decisions about children's daily experiences and routines, and who is involved in making these decisions? How do we ensure that experiences and routines are child-centred rather than adult-directed or clock-driven? How do we use conversations and interactions with children to make routine times enjoyable and meaningful learning opportunities? How do we develop a shared understanding of the learning outcomes and their importance to families?
1.1.3	Program learning opportunities	All aspects of the program, including routines, are organised in ways that maximise opportunities for each child's learning.	How do we use the learning outcomes to guide our goals and subsequent planning for individual children and groups of children? How do we plan and implement educational programs that are relevant and engaging for children?
1.2	Practice	Educators facilitate and extend each child's learning and development.	How do we arrange activities, routines and the physical environment to support children to make choices about what they would like to do and how they will do it? Do we provide children with the opportunity to make choices in circumstances where we promote their agency?
1.2.1	Intentional teaching		How do we demonstrate intention in our practice and how does this impact on outcomes for children?
1.2.2	Responsive teaching and scaffolding		How do we reflect on the range of intentional strategies suggested in the approved learning framework/s to support children's development and learning (for example, modelling and demonstrating, open questioning, speculating, explaining, engaging in shared thinking and problem solving
1.2.3	Child directed learning		How responsive are we to children's ideas, thinking and interests?

1.3	Assessment and planning		How do we recognise and support continuity of learning at the service, and how does information gathered from each child's home, school or other support service inform planning for continuity of learning? What do we do to critically reflect on and evaluate the program, how is this documented and how are our evaluations used to make informed curriculum decisions to improve outcomes for children?
1.3.2	Critical reflection		How do we currently examine our practices and decision-making, and identify improvements as well as successes? Have we considered which children may be advantaged and whether any child is disadvantaged?
1.3.3	Information for families		How can we work collaboratively with each family to share information about children's learning, development and participation in the program?
QA2		Children's health and safety <i>Children have the right to experience quality education and care in an environment that safeguards and promotes their health, safety and wellbeing.</i>	
2.1	Health		
2.1.1	Wellbeing and comfort		How do we seek information from children and families about children's wellbeing, physical comfort or personal needs, and support children sensitively within the service?
2.1.2	Health practices and procedures		How do we keep informed of, and implement, current practices and guidelines from recognised authorities
2.1.3	Healthy lifestyle		How do we ensure that all educators are familiar with current guidelines about healthy eating, physical activity, rest and safe sleeping? How do we plan food and beverages to meet the preferences of each child as well as their dietary and nutrition requirements, including during excursions or other special activities? How do we incorporate discussions and activities about healthy eating, physical activity and allergies into children's everyday experiences so that each child is encouraged to make healthy food and beverage choices?
2.2	Safety		How do we ensure that all educators understand and implement correct procedures relating to food handling, transportation and storage?

2.2.2	Incident and emergency management		How do we keep informed of, and implement, current practices and guidelines from recognised authorities in relation to: allergies and anaphylaxis » food safety and hygiene practices How do we identify which emergency procedures and specific action plans are required for our service and how often do we practise these? What recognised authorities are consulted in the development of these plans?
QA3		Physical environment <i>Physical environment is safe, suitable and provides a rich and diverse range of experiences that promote children's learning and development.</i>	
3.2	Use		How does the environment support children's learning? What barriers do we need to overcome? How are the backgrounds and cultures of families and the broader community reflected in the environment? How do we regularly evaluate the effectiveness of learning environments and draw links to the intended learning outcomes? What strategies can we implement to support educators to model environmentally responsible practices, and foster children's capacity to value and respect the broader environment?
3.2.2	Resources support play-based learning		
QA4		Staffing arrangements <i>Qualified and experienced educators, who develop warm, respectful relationships with children, create predictable environments and encourage children's active engagement in the learning program.</i>	
4.2.2	Professional standards		What opportunities do we provide for educators, co-ordinators and other staff to have conversations and discussions to further develop their skills, or to improve practice and relationships? How do we ensure that everyone's voice is heard and considered?
QA5		Relationships with children <i>Relationships with children are responsive, respectful and promote children's sense of security and belonging.</i>	
5.1	Relationships between educators and children		How do we deliberately, purposefully and thoughtfully interact with children to support their learning? What strategies and techniques do we use to extend and build on children's comments and conversations? How do we respond to the distress some children experience when they have to adapt to unfamiliar routines, new people and new places?



5.1.2	Dignity and rights of the child		<p>How do we consider the rights of every child when planning and implementing the program?</p> <p>How do we encourage all children to understand their rights and the rights of others?</p> <p>How do our service's policies and procedures support each child's dignity and rights?</p>
QA6		<p>Collaborative partnerships with families and communities</p> <p><i>Collaborative relationships with families are fundamental to achieving quality outcomes for children, and community partnerships based on active communication, consultation and collaboration are essential.</i></p>	
6.1	Supportive relationships with families		<p>What role do families play in the service? How can we recognise their contributions?</p> <p>How does the information that families provide to the service contribute to operational decision-making?</p> <p>How does the service establish and maintain meaningful partnerships with all families?</p> <p>How do we communicate our philosophy and educational choices with families?</p> <p>How do we encourage families to contribute to their child's experiences in ways that are meaningful for them?</p>
6.1.2	Parent views are respected		<p>How do we share decision-making with families? What decisions can we make together with families?</p> <p>How do we listen to families and include their perspectives in the educational program?</p> <p>How do we respond when families make requests or express concerns?</p>
6.1.3	Families are supported		<p>What strategies are in place for information sharing between families and the service during orientation, settling in and onwards?</p> <p>How do we find out and share information about the community resources that are relevant to our service and to the children in the service and their families?</p>
6.2	Collaborative partnerships		<p>How do we share our knowledge and expertise about children's learning and inclusion with other professionals who are working with children and families enrolled in the service?</p> <p>In what ways do we work with schools and other community organisations to support children and families? How effective are these strategies and how can we improve them?</p>

			How do we access support for children's specific individual requirements and rights?
6.2.2	Access and participation		What is happening in our local community that is relevant to our work with children and families? How can we best be involved?
QA7		Governance and Leadership <i>Effective leadership and governance of the service contributes to quality environments for children's learning and development.</i>	
7.1	Governance		What systems are in place to ensure the service's compliance with the National Law and Regulations? How and when are our policies and procedures reviewed? What systems are in place to ensure policies and procedures are being used to inform practice and is this information being communicated to families in respectful ways? How does the service involve stakeholders in consultation, evaluation and advisory processes?
7.2	Leadership		How is the leadership in our service contributing to the development of a positive organisational culture?
7.2.1	Continuous improvement		How are children, families and communities included in evaluating the quality of our service? How are resources allocated and targeted to support our quality improvement plan?
7.2.3	Development of professionals		What strategies are proving successful in building a professional learning community? How do we know they are successful?

\* Selected reflective questions from ACEQA (2018) Guide to National Quality Framework, updated January 2020  
[https://www.acecqa.gov.au/sites/default/files/2020-01/Guide-to-the-NQF\\_0.pdf](https://www.acecqa.gov.au/sites/default/files/2020-01/Guide-to-the-NQF_0.pdf)

\*\* the National Quality Standards are highlighted with coloured rows (eg 1.1 Program). Each Quality Area is a different colour consistent with the original document from which this information has been extracted.

**Appendix-2:** Sampling grid for selecting centres from which participants were interviewed, South Australia

Geographical location	Private centres	Community not-for-profit centres
Southern metropolitan area	Private centres in southern area, low SEIFA, new Private centres in southern area, low SEIFA, established Private centres in outer southern area, long distance commuters Private centres in largest expanding geographical area, low SEIFA, new Private social enterprises from the three largest services in SA: Goodstart, G8, Stepping Stones	Well established, southern area Well established, low SEIFA area Well established, outer southern area Well established, vegetarian food service
Central Adelaide area	Private centre from social enterprises, inner city, new	Inner city, most culturally diverse service in SA Best practice centre, inner city
North /West metropolitan area	Private centres in area north/west of Adelaide, low SEIFA Private social enterprises from the three largest services in SA: Goodstart, G8, Stepping Stones	Well established, north/west of Adelaide Well established, low SEIFA , vulnerable families Well established, area with many migrant families
Regional South Australia	Private centres, southern regional town	Southern regional centre, supporting many with children with additional needs Centres in regional SA area

**Appendix-3:** Letter of introduction, information sheet and consent form examples

Professor John Coveney

College of Medicine and Public Health,



Flinders University

GPO Box 2100

Adelaide SA 5001

Tel: 7221 8419

[john.coveney@flinders.edu.au](mailto:john.coveney@flinders.edu.au)

LETTER OF INTRODUCTION (to directors for cooks to participate)

Dear xxxx [name of centre's Director],

This letter is to introduce Louisa Matwiejczyk, who is a PhD candidate in Nutrition and Dietetics at Flinders University. Louisa is currently a lecturer and has for many years worked as a community-based dietitian in the ECEC sector or worked with families and young children.

Louisa is undertaking research as part of her PhD in early childhood early care settings and nutrition. She would be most grateful if you would be amenable to granting permission for Louisa to ask you and/or your staff to assist in this project, by taking part in an interview asking cooks about their experience and perception of nutrition guidelines, practices and food environments in childcare.

Interviews would take between 30-45 minutes on one occasion at the centre, or a location of the participant's choosing or by phone. Participation is voluntary. If you are amenable to you or your staff being invited to participate in this study, Louisa will contact you to arrange an interview.

Be assured that any information provided will be treated in the strictest confidence and none of the participants in the study will be individually identified in the resulting thesis or any subsequent publication. Similarly, childcare centres will also not be identified. Participants will be made aware that they are entirely free to discontinue their participation at any time or to decline to answer particular questions.

Any enquiries you may have concerning this project should be directed to me at the address given above or by telephone on 7221 8419 or via email ([john.coveney@flinders.edu.au](mailto:john.coveney@flinders.edu.au)).

Thank you for your attention and assistance.

Yours Sincerely, Professor John Coveney

*This research project has been approved by the Flinders University Social and Behavioural Ethics Committee (Project Number 7758) and by DECD. For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email [human.researchethics@flinders.edu.au](mailto:human.researchethics@flinders.edu.au). It has also been reviewed centrally and approved for DECD sites to participate in at the Directors discretion DECD*



## VERBAL OR EMAIL TEXT ASKING DIRECTORS FOR PERMISSION FOR COOKS TO PARTICIPATE

Hello. I am a dietitian who used to work with childcare centres for many years with *Start Right Eat Right* and am now working at Flinders University as a lecturer but undertaking a PhD. My area of interest is in nutrition and childcare.

This study is interested in asking cooks in childcare how easy it is to follow best practice guidelines and practices when providing food for childcare. It is also interested in knowing more about the factors affecting these, including possible barriers and facilitators.

Cooks have a crucial role in guiding and shaping children's nutrition in the short term but also for life. What children eat and are exposed to when they are very young is not only important for their immediate growth and development but also determines children's food preferences into adulthood.

This research project is an important study in the area of nutrition and the early childhood early care sector and the wider public community for the purpose of a better understanding the translation and impact of nutrition guidelines, practices and food environments in centre-based childcare. The information from this study will be used to help inform the implementation of nutrition best practice guidelines and nutrition policy in early childhood education and care settings. It will also be used to help inform nutrition support for cooks and educators.

This is completely voluntary, and anyone can withdraw or stop participating at any time. My supervisors are Professor John Coveney and A/Professor Kaye Mehta and I am undertaking this study in the discipline of Public Health [Nutrition and Dietetics] at Flinders University. The study has ethics approval by the Social and Behavioural Research Ethics Committee of Flinders University and by DECD.

I would like to interview cooks to hear about their views in person or by telephone. Interviews would take about 30-45 minutes and the information gathered would be confidential and participation anonymous. Specific childcare centres will also be anonymous.

Would you be willing to allow your cook to be invited to participate in this research study as a participant? If you are amenable to your staff participating, please indicate your consent and we can discuss how best to invite your cook. They will receive a Letter of Introduction, more information about the study, a consent form to sign and asked a few demographic questions (e.g.: position, gender).

If you would like to discuss this more please don't hesitate to phone me on 7221 8848 or email on [louisa.matwiejczyk@flinders.edu.au](mailto:louisa.matwiejczyk@flinders.edu.au)

Kind regards, Louisa



## INFORMATION FOR PARTICIPANTS)

### ***Supporting good food and nutrition practices in centre-based childcare settings in South Australia***

Louisa Matwiejczyk, (Supervisors: Prof. John Coveney, Assoc. Prof. Kaye Mehta)

#### Description of Study

This study asks educators including cooks what their experience and perceptions are of nutrition guidelines, practices and food environments. Also investigated will be directors' experience and views on how easy these guidelines and practices work in childcare, what are possible barriers and facilitators and what are the factors affecting these.

Cooks and Directors who work in centre-based childcare with children aged 2-6 years are invited to participate in this study.

#### **What does participating in the study involve?**

Participants are asked to participate in a face-to-face or phone interview.

Interviews would take between 30-45 minutes on one occasion at the centre, or a location of the participant's choosing or by phone. Participation is voluntary.

There is no obligation to take part in this research. You are, of course, entirely free to discontinue your participation at any time or to decline to answer particular questions. The data you have contributed will also be withdrawn.

#### **Confidentiality**

All data collected during the study will be de-identified at the time of collection and the strictest confidence will be maintained at all times. Any information provided will be treated in the strictest confidence and none of the participants in the study will be individually identified in the resulting thesis or any subsequent publication. Similarly, childcare centres will also not be identified

#### Benefits of participating

While there will not be any direct benefits to you from participating in this study, this research project is an important study for the discipline of nutrition, the wider early childhood early care sector and the wider public community for the purpose of a better understanding of the translation and impact of nutrition guidelines, practices and food environments in centre-based childcare.

#### Possible publication of findings

The results from this will be summarised and shared with the ECEC sector. The summary will be anonymous, and you can review this before it is sent out. The findings will also be part of my research, part of my PhD thesis and possibly published in a peer-reviewed journal.

#### More information

For more information, you can contact Louisa Matwiejczyk ([louisa.matwiejczyk@flinders.edu.au](mailto:louisa.matwiejczyk@flinders.edu.au)) by email or telephone on 08 7221 8848.

*This research project has been approved by the Flinders University Social and Behavioural Ethics Committee (Project Number 7758) and by DECD. For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email [human.researchethics@flinders.edu.au](mailto:human.researchethics@flinders.edu.au). It has also been reviewed centrally and approved for DECD sites to participate in at the Directors discretion DECD CS/17/000750-1.7*

**Appendix-4:** Table S1 Record of search strategies for umbrella review (Matwiejczyk et al., 2018)

Database	Platform	Number of retrieved citations
Medline 1946-present, includes Epub Ahead of Print; In-Process & Other Non-Indexed Citations; Ovid MEDLINE(R) Daily	Ovid	239
Emcare, 1995 to 2017 week 06	Ovid	303
PsycINFO, 1806 to February Week 1 2017	Ovid	30
Embase, 1974 to 2017 February 16	Ovid	649
CINAHL	EBSCOhost	11
Joanna Briggs Institute EBP Database, Feb 08, 2017-	Ovid	0
Cochrane Database of Systematic Reviews, Cochrane Database of Systematic Reviews: Issue 2 of 12, February 2017	Wiley	3
Health Technology Assessment Database: Issue 4 of 4, October 2016	Wiley	1
ERIC	ProQuest	7
Scopus		249
Web of Science Core Collection		162
<b>Total before duplicates removed</b>		<b>1654</b>
Total after duplicates removed		912?



#	Searches	Results
1	Child Care/	5284
2	Child Day Care Centers/	4649
3	(Day care or Daycare or Childcare or "in child care" or "long day child child" or Occasional care or Out-of-home care or Nurser* or ((Preschool* or Pre-school* or Kindergarten* or Child care or Early child* or Early learning or Early education* or early years or home-based or centre-based or center based) adj3 (care or educat* or center* or centre* or setting* or attend* or provider* or work* or service* or home* or enrol* or environment* or policy or policies or facility or facilities))).tw,kw.	36274
4	or/1-3	40821
5	Child, Preschool/	821652
6	(Child* or (Age* adj1 ("2-5" or "3-5")) or "Under 5" or "Under 5s" or Toddler* or Preschooler* or Pre-schooler* or pre-primary).tw,kw.	1196867
7	or/5-6	1593221
8	exp Diet/ or Child nutrition sciences/ or Child Nutritional Physiological Phenomena/ or Food services/ or Food habits/ or Food preferences/ or Menu planning/ or Cooking/ or Fruit/ or Vegetables/ or Food/ or Energy intake/ or Meals/ or Lunch/ or Snacks/ or Feeding behavior/ or Eating/ or Drinking/ or Nutritional requirements/ or Nutritional status/ or Recommended daily allowances/ or "Fruit and Vegetable Juices"/ or Milk/	481612
9	(Diet* or Nutrition* or Eat or Eater* or Eating or Feed or Feeding or Food* or Drink* or Beverage* or Juice* or Milk* or Fruit* or Vegetables or Menu* or Lunch* or Breakfast* or snack* or Morning tea* or Afternoon tea* or ((Energy or kalori* or kilojou* or nutrient*) adj1 (intake or consum*)) or ((portion* or serving or plate*) adj1 (size* or wast*)) or cook* or cater*).tw,kw.	1315314
10	or/8-9	1436846
11	4 and 7 and 10	3761
12	(meta analys* or metaanalys*).mp,pt. or review*.ti,pt. or (search* or MEDLINE or systematic review or synthesis).tw.	3196110
13	11 and 12	332
14	(infan* not child*).ti.	169275

15	13 not 14	314
16	(case reports or comment or editorial or letter or news).pt.	3357292
17	15 not 16	307
18	limit 17 to yr="2000 -Current"	239

Ovid Emcare 1995 to 2017 week 06

#	Searches	Results
1	child care/ or kindergarten/ or nursery/	19350
2	day care/	3477
3	(Day care or Daycare or "day child care" or Childcare or "in child care" or "long day child care" or Occasional care or Out-of-home care or Nurser* or ((Preschool* or Pre-school* or Kindergarten* or Child care or Early child* or Early learning or Early education* or early years or home-based or centre-based or center based) adj3 (care or educat* or center* or centre* or setting* or attend* or provider* or work* or service* or home* or enrol* or environment* or policy or policies or facility or facilities))).tw,kw.	18404
4	or/1-3	32522
5	preschool child/	69625
6	(Child* or (Age* adj1 ("2-5" or "3-5")) or "Under 5" or "Under 5s" or Toddler* or Preschooler* or Pre-schooler* or pre-primary).tw,kw.	387495
7	or/5-6	409350
8	exp diet/ or nutritional science/ or child nutrition/ or catering service/ or feeding behavior/ or eating habit/ or food preference/ or portion size/ or cooking/ or fruit/ or fruit juice/ or "fruit and vegetable juice"/ or vegetable juice/ or food/ or caloric intake/ or meal/ or fast food/ or feeding behavior/ or drinking/ or eating/ or nutritional requirement/ or nutritional status/ or milk/	172475
9	(Diet* or Nutrition* or Eat or Eater* or Eating or Feed or Feeding or Food* or Drink* or Beverage* or Juice* or Milk* or Fruit* or Vegetables or Menu* or Lunch* or Breakfast* or snack* or Morning tea* or Afternoon tea* or ((Energy or calori* or kilojou* or nutrient*) adj1 (intake or consum*)) or ((portion* or serving or plate*) adj1 (size* or wast*)) or cook* or cater*).tw,kw.	326887

10	or/8-9	347638
11	4 and 7 and 10	2653
12	(meta analys* or metaanalys*).mp,pt. or review.ti,pt. or (search* or MEDLINE or synthesis).ab. or systematic review.tw,sh.	709924
13	11 and 12	341
14	(infan* not child*).ti.	37959
15	13 not 14	328
16	(editorial or letter or note).pt.	691896
17	15 not 16	326
18	limit 17 to yr="2000 -Current"	303

PsycINFO 1806 to February Week 2 2017

#	Searches	Results
1	child care/ or child day care/ or preschool students/ or nursery school students/ or kindergarten students/	22585
2	(Day care or Daycare or Childcare or "day child care" or "in child care" or "long day child care" or Occasional care or Out-of-home care or Nurser* or ((Preschool* or Pre-school* or Kindergarten* or Child care or Early child* or Early learning or Early education* or early years or home-based or centre-based or center based) adj3 (care or educat* or center* or centre* or setting* or attend* or provider* or work* or service* or home* or enrol* or environment* or policy or policies or facility or facilities))).ti,ab,id.	35883
3	or/1-2	49333
4	(Child* or (Age* adj1 ("2-5" or "3-5")) or "Under 5" or "Under 5s" or Toddler* or Preschooler* or Pre-schooler* or pre-primary).ti,ab,id.	622000
5	preschool age 2 5 yrs.ag.	115538
6	or/4-5	637379
7	diets/ or eating behavior/ or fast food/ or food preferences/ or nutrition/ or food/ or fast food/ or food intake/ or food preparation/	47095

8	(Diet* or Nutrition* or Eat or Eater* or Eating or Feed or Feeding or Food* or Drink* or Beverage* or Juice* or Milk* or Fruit* or Vegetables or Menu* or Lunch* or Breakfast* or snack* or Morning tea* or Afternoon tea* or ((Energy or calori* or kiljou* or nutrient*) adj1 (intake or consum*)) or ((portion* or serving or plate*) adj1 (size* or wast*)) or cook* or cater*).ti,ab,id.	212956
9	or/7-8	214881
10	3 and 6 and 9	1873
11	(systematic review or meta analysis or metasyntesis).md,mp. or (search or medline or synthesis).ti,ab.	115007
12	10 and 11	33
13	(infan* not child*).ti.	29128
14	12 not 13	32
15	(column* or comment* or editorial or letter).dt.	179335
16	14 not 15	32

Embase 1974 to 2017 February 16

#	Searches	Results
1	child care/ or kindergarten/ or nursery/ or day care/	53995
2	(Day care or Daycare or "day child care" or Childcare or "in child care" or Occasional care or Out-of-home care or Nurser* or ((Preschool* or Pre-school* or Kindergarten* or Child care or Early child* or Early learning or Early education* or early years or home-based or centre-based or center based) adj3 (care or educat* or center* or centre* or setting* or attend* or provider* or work* or service* or home* or enrol* or environment* or policy or policies or facility or facilities))).tw,kw.	43368
3	or/1-2	80284
4	preschool child/	541354
5	(Child* or (Age* adj1 ("2-5" or "3-5")) or "Under 5" or "Under 5s" or Toddler* or Preschooler* or Pre-schooler* or pre-primary).tw,kw.	1478970
6	or/4-5	1731472

7	exp diet/ or nutritional science/ or child nutrition/ or catering service/ or feeding behavior/ or eating habit/ or food preference/ or portion size/ or cooking/ or fruit/ or fruit juice/ or "fruit and vegetable juice"/ or vegetable juice/ or food/ or caloric intake/ or meal/ or fast food/ or feeding behavior/ or drinking/ or eating/ or nutritional requirement/ or nutritional status/ or milk/	764626
8	(Diet* or Nutrition* or Eat or Eater* or Eating or Feed or Feeding or Food* or Drink* or Beverage* or Juice* or Milk* or Fruit* or Vegetables or Menu* or Lunch* or Breakfast* or snack* or Morning tea* or Afternoon tea* or ((Energy or calori* or kilojou* or nutrient*) adj1 (intake or consum*)) or ((portion* or serving or plate*) adj1 (size* or wast*)) or cook* or cater*).tw,kw.	1616195
9	or/7-8	1731079
10	3 and 6 and 9	6326
11	(meta analys* or metaanalys*).mp,pt. or review.ti,pt. or (search* or MEDLINE or synthesis).ab. or systematic review.tw,sh.	3335034
12	10 and 11	797
13	(infan* not child*).ti.	176689
14	12 not 13	749
15	(editorial or letter or note).pt.	2183151
16	14 not 15	748

#### CINAHL (EBSCOhost)

#	Query	Limiters/Expanders	Results
S1	(MH "Child Day Care") OR (MH "Schools, Nursery")	Search modes - Boolean/Phrase	2,248
S2	TI ( ("Day care" OR Daycare OR "day child care" OR Childcare OR "in child care" OR "long day child care" OR "Occasional care" OR "Out-of-home care" OR Nurser* OR ((Preschool* OR "Pre-school*" OR Kindergarten* OR "Child care" OR "Early child*" OR "Early learning" OR "Early education*" OR "early years" OR "home-based" OR "centre-based" OR "center based") N2 (care OR educat*	Search modes - Boolean/Phrase	12,779

	OR center* OR centre* OR setting* OR attend* OR provider* OR work* OR service* OR home* OR enrol* OR environment* OR policy OR policies OR facility OR facilities))) ) OR AB ( ("Day care" OR Daycare OR Childcare OR "in child care" OR "Occasional care" OR "Out-of-home care" OR Nurser* OR ((Preschool* OR "Pre-school*" OR Kindergarten* OR "Child care" OR "Early child*" OR "Early learning" OR "Early education*" OR "early years" OR "home-based" OR "centre-based" OR "center based") N2 (care OR educat* OR center* OR centre* OR setting* OR attend* OR provider* OR work* OR service* OR home* OR enrol* OR environment* OR policy OR policies OR facility OR facilities))) )		
S3	S1 OR S2	Search modes - Boolean/Phrase	13,684
S4	TI ( (Child* OR (Age* N0 ("2-5" OR "3-5")) OR "Under 5" OR "Under 5s" OR Toddler* OR Preschooler* OR "Pre-schooler*" OR "pre-primary" ) ) OR AB ( (Child* OR (Age* N0 ("2-5" OR "3-5")) OR "Under 5" OR "Under 5s" OR Toddler* OR Preschooler* OR "Pre-schooler*" OR "pre-primary" ) )	Search modes - Boolean/Phrase	209,646
S5	(MH "Child, Preschool")	Search modes - Boolean/Phrase	102,931
S6	S4 OR S5	Search modes - Boolean/Phrase	250,454
S7	TI ( (Diet* OR Nutrition* OR Eat OR Eater* OR Eating OR Feed OR Feeding OR Food* OR Drink* OR Beverage* OR Juice* OR Milk* OR Fruit* OR Vegetables OR Menu* OR Lunch* OR Breakfast* OR snack* OR "Morning tea*" OR "Afternoon tea*" OR ((Energy OR kalori* OR kilojou* OR nutrient*) N0 (intake OR consum*)) OR ((portion* OR serving OR plate*) N0 (size* OR wast*)) OR cook* OR cater* ) ) AND AB ( (Diet* OR Nutrition* OR Eat OR Eater* OR Eating OR Feed OR Feeding OR Food* OR Drink* OR Beverage* OR Juice* OR Milk* OR Fruit* OR Vegetables OR Menu* OR Lunch* OR Breakfast* OR snack* OR "Morning tea*" OR "Afternoon tea*" OR ((Energy OR kalori* OR kilojou* OR nutrient*) N0 (intake OR consum*)) OR	Search modes - Boolean/Phrase	35,927

	((portion* OR serving OR plate*) N0 (size* OR wast*)) OR cook* OR cater* )		
S8	(MH "Child Nutritional Physiology") OR (MH "Diet+") OR (MH "Child Nutrition") OR (MH "Food Services") OR (MH "Menu Planning") OR (MH "Food Preferences") OR (MH "Eating Behavior") OR (MH "Food Habits") OR (MH "Meal Preparation") OR (MH "Cooking") OR (MH "Fruit") OR (MH "Vegetables") OR (MH "Meals") OR (MH "Breakfast") OR (MH "Lunch") OR (MH "Snacks") OR (MH "Eating") OR (MH "Drinking Behavior") OR (MH "Nutritional Requirements") OR (MH "Dietary Reference Intakes") OR (MH "Fruit Juices") OR (MH "Milk")	Search modes - Boolean/Phrase	85,253
S9	S7 OR S8	Search modes - Boolean/Phrase	104,956
S10	S3 AND S6 AND S9	Search modes - Boolean/Phrase	625
S11	(MH "Systematic Review") OR (MH "Meta Analysis")	Search modes - Boolean/Phrase	39,187
S12	PT ( Meta Analysis OR Meta Synthesis OR Systematic Review ) OR TI ( meta analys* OR metaanalys* OR "systematic review" ) OR AB ( meta analys* OR metaanalys* OR "systematic review" )	Limiters - Published Date: 20000101-20171231; Publication Type: Meta Analysis, Meta Synthesis, Systematic Review Search modes - Boolean/Phrase	40,646
S13	S11 OR S12	Search modes - Boolean/Phrase	54,758
S14	S10 AND S13	Search modes - Boolean/Phrase	11

#	Searches	Results
1	(Day care or Daycare or Childcare or "in child care" or "long day child child" or Occasional care or Out-of-home care or Nurser* or ((Preschool* or Pre-school* or Kindergarten* or Child care or Early child* or Early learning or Early education* or early years or home-based or centre-based or center based) adj3 (care or educat* or center* or centre* or setting* or attend* or provider* or work* or service* or home* or enrol* or environment* or policy or policies or facility or facilities))).ti,hw,sh.	21
2	(Child* or (Age* adj1 ("2-5" or "3-5")) or "Under 5" or "Under 5s" or Toddler* or Preschooler* or Pre-schooler* or pre-primary).ti,hw,sh.	337
3	(Diet* or Nutrition* or Eat or Eater* or Eating or Feed or Feeding or Food* or Drink* or Beverage* or Juice* or Milk* or Fruit* or Vegetables or Menu* or Lunch* or Breakfast* or snack* or Morning tea* or Afternoon tea* or ((Energy or calori* or kilojou* or nutrient*) adj1 (intake or consum*)) or ((portion* or serving or plate*) adj1 (size* or wast*)) or cook* or cater*).ti,hw,sh.	289
4	((Day care or Daycare or Childcare or "in child care" or "long day child child" or Occasional care or Out-of-home care or Nurser* or ((Preschool* or Pre-school* or Kindergarten* or Child care or Early child* or Early learning or Early education* or early years or home-based or centre-based or center based) adj3 (care or educat* or center* or centre* or setting* or attend* or provider* or work* or service* or home* or enrol* or environment* or policy or policies or facility or facilities))) and (Child* or (Age* adj1 ("2-5" or "3-5")) or "Under 5" or "Under 5s" or Toddler* or Preschooler* or Pre-schooler* or pre-primary) and (Diet* or Nutrition* or Eat or Eater* or Eating or Feed or Feeding or Food* or Drink* or Beverage* or Juice* or Milk* or Fruit* or Vegetables or Menu* or Lunch* or Breakfast* or snack* or Morning tea* or Afternoon tea* or ((Energy or calori* or kilojou* or nutrient*) adj1 (intake or consum*)) or ((portion* or serving or plate*) adj1 (size* or wast*)) or cook* or cater*).ti,hw,sh.	0
5	limit 4 to systematic reviews	0

Web of Science Core Collection

N=162

((“Day care” OR Daycare OR Childcare OR "in child care" OR “long day child care” OR “Occasional care” OR “Out-of-home care” OR Nurser\* OR ((Preschool\* OR “Pre-school\*” OR Kindergarten\* OR “Child care” OR “Early child\*” OR “Early learning” OR “Early education\*” OR “early years” OR “home-based” OR “centre-based” OR “center based”) NEAR/2 (care OR educat\* OR center\* OR centre\* OR setting\* OR attend\* OR provider\* OR work\* OR service\* OR home\* OR enrol\* OR environment\* OR



policy OR policies OR facility OR facilities))) AND (Child\* OR (Age\* NEAR/0 ("2-5" OR "3-5")) OR "Under 5" OR "Under 5s" OR Toddler\* OR Preschooler\* OR "Pre-schooler\*" OR "pre-primary") AND ((Diet\* OR Nutrition\* OR Eat OR Eater\* OR Eating OR Feed OR Feeding OR Food\* OR Drink\* OR Beverage\* OR Juice\* OR Milk\* OR Fruit\* OR Vegetables OR Menu\* OR Lunch\* OR Breakfast\* OR snack\* OR Morning tea\* OR Afternoon tea\* OR ((Energy OR kalori\* OR kilojou\* OR nutrient\*) NEAR/0 (intake OR consum\*)) OR ((portion\* OR serving or plate\*) NEAR/0 (size\* OR wast\*)) OR cook\* OR cater\*))

Refined by: PUBLICATION YEARS: ( 2016 OR 2003 OR 2015 OR 2014 OR 2013 OR 2012 OR 2002 OR 2010 OR 2011 OR 2009 OR 2008 OR 2007 OR 2006 OR 2005 OR 2017 OR 2004 OR 2000 OR 2001 ) AND **DOCUMENT TYPES: ( REVIEW )**

Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI, CCR-EXPANDED, IC.

ERIC (Educational Resources Information Center)

N=7

((("Day care" OR Daycare OR Childcare OR "in child care" OR "day child care" OR "Occasional care" OR "Out-of-home care" OR Nurser\* OR ((Preschool\* OR "Pre-school\*" OR Kindergarten\* OR "Child care" OR "Early child\*" OR "Early learning" OR "Early education\*" OR "early years" OR "home-based" OR "centre-based" OR "center based") NEAR/2 (care OR educat\* OR center\* OR centre\* OR setting\* OR attend\* OR provider\* OR work\* OR service\* OR home\* OR enrol\* OR environment\* OR policy OR policies OR facility OR facilities))) AND (Child\* OR (Age\* NEAR/0 ("2-5" OR "3-5")) OR "Under 5" OR "Under 5s" OR Toddler\* OR Preschooler\* OR "Pre-schooler\*" OR "pre-primary") AND ((Diet\* OR Nutrition\* OR Eat OR Eater\* OR Eating OR Feed OR Feeding OR Food\* OR Drink\* OR Beverage\* OR Juice\* OR Milk\* OR Fruit\* OR Vegetables OR Menu\* OR Lunch\* OR Breakfast\* OR snack\* OR "Morning tea\*" OR "Afternoon tea\*" OR ((Energy OR kalori\* OR kilojou\* OR nutrient\*) NEAR/0 (intake OR consum\*)) OR ((portion\* OR serving or plate\*) NEAR/0 (size\* OR wast\*)) OR cook\* OR cater\*))

Scopus

n=249

(( ( TITLE-ABS-KEY ( "Day care" OR daycare OR childcare OR "in child care" OR "day child care" OR "Occasional care" OR "Out-of-home care" OR "long day child care" OR nurser\* ) ) OR ( TITLE-ABS-KEY ( ( ( preschool\* OR "Pre-school\*" OR kindergarten\* OR "Child care" OR "Early child\*" OR "Early learning" OR "Early education\*" OR "early years" OR "home-based" OR "centre-based" OR "center based" ) near/2 ( care OR educat\* OR center\* OR centre\* OR setting\* OR attend\* OR provider\* OR work\* OR service\* OR home\* OR enrol\* OR environment\* OR policy OR policies OR facility OR facilities ) ) ) ) ) AND ( TITLE-ABS-KEY ( child\* OR ( ( age OR aged OR ages ) W/0 ( "2-5" OR "3-5" ) ) OR "Under 5" OR "Under 5s" OR toddler\* OR preschooler\* OR "Pre-schooler\*" OR "pre-primary" ) ) ) AND ( ( TITLE-ABS-

KEY ( diet\* OR nutrition\* OR eat OR eater\* OR eating OR feed OR feeding OR food\* OR drink\* OR beverage\* OR juice\* OR milk\* ) OR ( TITLE-ABS-KEY ( fruit\* OR vegetables OR menu\* OR lunch\* OR breakfast\* OR snack\* OR "Morning tea\*" OR "Afternoon tea\*" ) ) OR ( TITLE-ABS-KEY ( ( ( energy OR kalori\* OR kilojou\* OR nutrient\* ) W/O ( intake OR consum\* ) ) ) ) OR ( TITLE-ABS-KEY ( ( ( portion\* OR serving OR plate\* ) near/0 ( size\* OR wast\* ) ) ) ) OR ( TITLE-ABS-KEY ( ( ( portion\* OR serving OR plate\* ) W/O ( size\* OR wast\* ) ) ) ) OR ( TITLE-ABS-KEY ( cook\* OR cater\* ) ) ) AND ( LIMIT-TO ( PUBYEAR , 2017 ) OR LIMIT-TO ( PUBYEAR , 2016 ) OR LIMIT-TO ( PUBYEAR , 2015 ) OR LIMIT-TO ( PUBYEAR , 2014 ) OR LIMIT-TO ( PUBYEAR , 2013 ) OR LIMIT-TO ( PUBYEAR , 2012 ) OR LIMIT-TO ( PUBYEAR , 2011 ) OR LIMIT-TO ( PUBYEAR , 2010 ) OR LIMIT-TO ( PUBYEAR , 2009 ) OR LIMIT-TO ( PUBYEAR , 2008 ) OR LIMIT-TO ( PUBYEAR , 2007 ) OR LIMIT-TO ( PUBYEAR , 2006 ) OR LIMIT-TO ( PUBYEAR , 2005 ) OR LIMIT-TO ( PUBYEAR , 2004 ) OR LIMIT-TO ( PUBYEAR , 2003 ) OR LIMIT-TO ( PUBYEAR , 2002 ) OR LIMIT-TO ( PUBYEAR , 2001 ) OR LIMIT-TO ( PUBYEAR , 2000 ) ) AND ( LIMIT-TO ( DOCTYPE , "re" ) )

**Appendix-5:** Table S2; Critical appraisal results for the included reviews using 11 critical appraisal criteria (The Johanna Briggs Institute 2014)

Quality Assessment Criteria	Is the review question clearly and explicitly stated	Were the inclusion criteria appropriate for the review question	Was the search strategy appropriate	Were the sources and resources used to search for studies adequate	Were the criteria for appraising studies appropriate	Was critical appraisal conducted by two or more reviewers independently	Were there methods to minimize errors in data extraction	Were the methods used to combine studies appropriate	Was the likelihood of publication bias assessed	Were recommendations for policy and/or Practice supported by the reported data	Were the specific directives for new research appropriate	Included /Excluded
Bell & Golley 2015	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Included
Campbell & Hesketh 2007	Y	Y	U	U	N	U	U	Y	N	N	N	Excluded
Hesketh & Campbell 2010	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Included
Larson et al 2011	Y	U	N	N	N	U	N	Y	N	Y	Y	Excluded
Ling et al 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Included
Mikkelsen et al 2014	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Included
Morris et al 2015	Y	Y	Y	Y	Y	U	Y	Y	N	Y	Y	Included
Nixon et al 2012	Y	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	Included
Sisson et al 2016	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Included
Ward, D et I 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Included
Ward S, et al 2015	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Included
Ward S, et al 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Included
Wolfenden et al 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Included
Zhou et al 2012	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Included

N, no, critical appraisal criterion was not met; N/A, criteria appraisal criterion was not applicable; U, unclear whether critical appraisal criterion was met; Y, yes, critical appraisal criterion was met.

**Appendix-6:** Table S3: Characteristics of included systematic reviews (using JBI Data Extraction Form for Systematic Reviews and Research Syntheses, Aromataris et al., 2015, The Johanna Briggs Institute 2014)

Author/Year of publication	Systematic review objectives	Participant characteristics/sample/setting	Description of interventions	Sources searched	Year range of included studies	Number of included primary studies /Total number of diet-related studies in review (Total number of studies in review)	Types of studies/number and types of study design of included studies	Country of origin of included studies	Appraisal rating of included studies/Appraisal instrument used
Bell & Golley 2015	<p><i>Primary</i> Evaluate the effectiveness of nutrition promotion interventions on children's dietary intake</p> <p><i>Secondary</i> Evaluate environmental and individual factors; centre's nutrition policies, centre's practices, food provided, knowledge and attitudes of educators, parents, children</p>	<p>Children 0-5 years, providers and staff or parents of children in formal childcare care</p> <p>Children n=28-8950 (total 18998) Educators/directors/cooks n=9-87 (total 385) Staff n=30-496 (total 994) Centres n=1-229 (total 575)</p>	Any intervention that included a nutrition component targeting staff (e.g. training), children (e.g. nutrition curriculum) or parents/ caregivers (e.g. education sessions) that aimed to influence children's nutritional intake.	CINAHL, Medline (n=2) Reference lists and recent reviews	Up to June 2013	25/26 (excluded Bravo et al 2008 as FDC study)	<p>Prospective studies with or without a comparison group, evaluating the effectiveness of an intervention of any duration, with outcomes measured at baseline and post intervention</p> <p>9 cohort pre-post studies, 7 CCT, 1 pilot CCT, 1 cross-over study, 4 RCT, 1 cross-over cluster-RCT, 1 pilot cohort, 1 cross-over quasi-experimental design</p>	USA (n=19), Australia (n=4), Germany (n=1) UK (n=1)	14 weak, 11 moderate quality

Hesketh & Campbell 2010	Evaluate effectiveness of interventions designed to prevent obesity, promote healthy eating and/or physical activity or reduce sedentary behaviours	Children 0-5 years Family/home, group, primary care, pre-school/formal childcare and mixed settings  Children n=1,810 Centres- not reported	Any intervention designed to prevent obesity, promote healthy eating and/or physical activity or reduce sedentary behaviour	Academic Search Premier, Cumulative Index to Nursing and Allied Health Literature, Cochrane Central Register of Controlled Trials, Communication, Global Health, Health Source: Nursing/Academic, Medline, PsychINFO, Psychology, and Behavioral Sciences (n=10) Reference lists Contacted researchers with emerging studies	Jan 1995-Aug 2008	3/9 (23 studies in all settings) 9 in preschool or childcare, 3 of these diet related  Included studies: Fitzgibbon et al 2005, Fitzgibbon et al 2006, Williams et al 2004	Experimental studies 2 cluster- RCT, 1 CCT	Not reported but mostly in the USA. All diet-related studies in USA	2 moderate, 1 strong quality
Ling & Wen 2016	<i>Primary</i> Examine effects of prevention and management interventions on overweight/obesity <i>Secondary</i> Explore factors that may influence intervention effects	Formal childcare/preschool, community and home settings Children aged 2–5 years  295 centres (range 4 to 79), 7,805 (range 101 to 1663) children	Any intervention that aimed to improve behaviours, including screen time, sedentary activity, physical activity, diet, and/or sleep	PubMed, CINAHL, EMBASE, PsycINFO, ERIC, and Cochrane library n=6 Reference lists of reviews	Up to Feb 2015	13/19 (26 studies in all settings) Nutrition/PA x 12 studies Nutrition only x 1  Excluded studies which were PA only or sedentary behaviour only: Annesi et al 2013a, 2013b,	13 Cluster RCTs Included studies with a sample size > 30	USA (n = 6), Switzerland (n = 1), Germany (n = 1), Israel (n = 2), Belgium (n = 1), France (n=1) Australia (n = 1)	1 study low risk of bias (Burgi et al 2012), others insufficient info for evaluation

						Bonvin et al 2013, De Bock 2013, Dennison et al 2004, Reilly et al 2006.			
Mikkelsen et al 2014	Analyse the effectiveness of different strategies in relation to their influence on children's food choice at an early age, provide recommendations for future interventions	3 to 6 year-olds, educators – NOT parents Preschools (13), kindergartens (10) and day care facilities (3)  16-6102 children 26 centres	Any healthy eating intervention attempting to prevent obesity with a focus on diet, nutrition, food, eating or meals in day care facilities	PubMed, Scopus, Web of Science and CINAHL (n=4) Reference lists	1980-2014	26 8 single interventions 11 educational 7 multi-component	Intervention studies with baseline and follow-up measurements  11 RCTs, 9 quasi-RCTs, 1 cross-over, 2 pre-post test design, 3 cluster-RCT	North America (n=17), South America (n=1), Asia (n=5), European context (n=3)	4 weak, 9 moderate, 10 strong, 3 very strong quality
Morris et al 2015	(1) How have parents been incorporated into childhood obesity interventions conducted in ECEC settings and to what extent, if any, does their involvement impact the outcomes of the intervention? (2) What are the methodological limitations of ECEC childhood obesity prevention interventions that have included a parental component? (3) What recommendations can be made for future research?	Parents of children in ECEC settings  22,267 children plus DeCoen's et al 2012 not reported (range 289-12000), 275 centres plus those from 4 unspecified studies (range 7-64 centres) Most trials recruited <20 centres (6/11)	Any interventions to prevent obesity or risk factors (diet, PA) with a parental component. Single setting interventions excluded.	Academic Source Complete, CINAHL, Global Health, ERIC, Health Source, Medline and PsychInfo (n=7) Reference lists searched	2000-2014	12/15 studies Excluded Story et al 2012 (schools), Reilly et al 2006 (PA only), Dennison et al 2004 (sedentary behaviour only), De Bock et al 2013 (PA only). Included De Bock et al 2012.	Experimental studies  2 RCT, 6 cluster RCT, 3 quasi-experimental, 1 prospective cohort	USA (n=4), Australia (n=2), China (n=1), Belgium (n=1), Germany (n=2), Columbia (n=1), Switzerland (n=1)	6 fair, 7 good No studies classified as excellent or poor
Nixon et al 2012	To identify the most effective behavioural models and behaviour change strategies, underpinning preschool and school-based interventions aimed at	4-6 year olds preschool- and school based  no sample sizes reported	Any preschool- or school based interventions for preventing obesity in 4-6-year-olds	MEDLINE, EMBASE, CINAHL, PsycINFO and The Cochrane Library (n=5)	1995-2010	4/9 (12 studies including schools)  4 studies diet-related (5 studies	RCT, Non-RCT With 'before and after' measures in the same children Plus follow-up periods of 6	Germany (n=1), Nth America (n=1), Asia (n=1), Australia (n=1)	1 strong, 3 moderate, quality

	preventing obesity in 4–6-year-olds.			Hand Searching of reviews and reference lists		preschoolers but PA only. Four studies diet-related but school-based)	months or longer 1 RCT, 3 cluster RCT		
Sisson et al 2016	Identify interventions that target obesogenic behaviours in child care centres and (1) Examine the duration, use of behavioural theory, and intervention targets, including the child care environment, teacher, parents, and children; (2) Describe the intervention strategies and their effectiveness	3-to-5-year-old children Child care settings  no sample sizes reported	Interventions designed to reduce obesity and improve obesogenic behaviours, including physical activity, diet, and screen time, at child care centres.	PubMed, PsychInfo, and Ovid (n=3) Manual searches of personal records were also conducted, along with screening of previous review articles and reference lists of identified articles	Up to January 2016	44/45 (71 interventions including PA only) Excluded Cespedes et al 2013 as in Colombia  22 RCTs, 19 quasi-experimental or pre-post design, 3 non-experimental	All experimental designs were eligible	Not stated	22 Level II, 19 Level III, 3 Level IV
Ward S, et al 2015	To identify a) if childcare educators' practices predict or are associated with pre-schoolers' physical activity and eating behaviours in childcare centres b) to assess the effectiveness of interventions that control educators' practices or behaviours in order to improve pre-schoolers' physical activity and eating behaviours	Pre-schoolers, educators Childcare facilities  19-97 children, 1-19 childcare centres	Any interventions assessing the impact of childcare educators' practices or behaviours on children's physical activity or eating behaviours	PubMed, The Cochrane Library, Science Direct, SportDiscus, CINAHL and Wiley (n=6)  Reference lists and reviews	Up to July 2015	5/15  Only 5 studies assessed diet, rest PA only  2 quasi-experimental , 2 pre-post design, 1 cross-over RCT	All types of quantitative study designs but multi-component interventions, or those where the study results could not be explained solely by the educators' practices or behaviours were excluded	5/5 USA for diet-related  USA (n=14), Netherland (n=1)	3 low, 2 moderate quality
Ward S, et al 2016	To examine the relationship between preschoolers' eating behaviours and physical activity, and those of their peers	2 and 5 years of age  No specific setting defined, but mostly childcare centres	Quantitative studies examining the relationship between preschoolers' eating behaviours	Science Direct, PsychInfo, PubMed, Medline, ERIC, SportDiscus	Up to July 2015	7/13  3 non-randomised controlled trials, 3 pre-	All types of quantitative studies, including non-randomized and observational	USA (n=4), England (n= 1), Wales (n= 1), Brazil (n=1)	2 moderate, 5 low quality

		14-66 children (total 260 children in 6 single-centre studies). Sample not reported for one study.	and physical activity, and those of their peers  How preschoolers' eating behaviours and physical activity relate to their peers' behaviours	and CINAHL (n=7) Reference lists and reviews		post design, 1 RCT	type as can provide impetus for future RCT		
Ward, D et al 2016	To identify the most promising obesity prevention intervention characteristics associated with successful behavioural and/or anthropometric outcomes  1. Is <b>intervention strength</b> related to successful behavioural and/or anthropometric outcomes? 2. Are interventions that incorporate <b>parent engagement</b> more effective than those that do not? 3. Can specific <b>intervention elements</b> be identified that relate to desired outcomes, including number of intervention strategies used, potential impact of the strategies, and frequency and duration of these strategies? 4. Is overall <b>study quality</b> related to successful behavioural and/or anthropometric outcomes?  Developed a coding strategy to assess intervention strength and allow for examination of several study questions.	Children ages 0–6 years (actually children aged 2-6 years), mostly low and middle SES Early care and education centres  1-31 centres, 57-2062 children	Any obesity prevention interventions in centre-based ECEC settings  What specific intervention characteristics and strategies contribute to intervention effectiveness for obesity prevention in centre-based child care.	PubMed, ERIC, and Web of Science (n=3) Reference searching of reviews and articles	2010-2015	18/43 unique interventions , 26 had dietary-component but only 18 reported outcomes  6 Pre-post design, 4 cluster RCT, 4 RCT, 3 randomised cross-over trial, 1 quasi-experimental trial	All study designs, except case studies, were included if a pre- and post-evaluation was conducted and used an objective or validated measure	US (n=11), Australia (n=1), Germany (n=1), Switzerland (n=1), Chile (n=1), Belgium (n=1), Spain (n=1), and Turkey (n=1)	3 strong, 4 moderate, and 11 weak global rating



Wolfenden et al 2016	<p><i>Primary</i> Examine the effectiveness of strategies aimed at improving the implementation of policies, practices or programmes by childcare services that promote child healthy eating, physical activity and/or obesity prevention.</p> <p><i>Secondary</i> 1. describe the impact of such strategies on childcare service staff knowledge, skills or attitudes; 2. describe the cost or cost-effectiveness of such strategies; 3. describe any adverse effects of such strategies on childcare services, service staff or children</p>	<p>Children typically up to the age of 5-6 years, staff Centre-based childcare services (preschools, nurseries, long day-care services and kindergartens that cater for children prior to compulsory schooling).</p> <p>Most trials recruited &lt;20 centres 1053 centres participated across all trials 5/8 diet-related studies in childcare services in disadvantaged areas or serving disadvantaged. 3/8 SES not described</p>	<p>Any strategy with the primary intent of improving the implementation of policies, practices or programmes in centre-based childcare services to promote healthy eating, physical activity or prevent unhealthy weight gain</p>	<p>Cochrane Central Register of Controlled trials (CENTRAL), MEDLINE, MEDLINE In Process, EMBASE, PsycINFO, ERIC, CINAHL and SCOPUS (n=8) Reference lists of included trials, hand searched two international implementation science journals World Health Organization International Clinical Trials Registry Platform and ClinicalTrials.</p>	<p>Up to August 2015</p>	<p>8/10 2 healthy eating, 6 healthy eating and physical activity 3 Cluster-randomised controlled-trial, 2 quasi-experimental trial, 1 randomised trial, 1 randomised controlled trial, 1 randomised parallel-group trial</p>	<p>Any study (randomised or non-randomised) with a parallel control group that compared any strategy to improve the implementation of a healthy eating, physical activity or obesity prevention policy, practice or programme to no intervention, 'usual' practice or an alternative strategy. Included baseline.</p>	<p>USA (n=5), Australia (n=2), Ireland (n=1)</p>	<p>All studies had high risk of bias for at least one domain</p>
Zhou et al 2012	<p><i>Primary</i> To assess the efficacy of childhood obesity interventions in childcare settings on outcomes of dietary intake, physical activity, and adiposity,</p> <p><i>Secondary</i> To identify gaps and limitations of the existing studies and recommend priorities for future research.</p>	<p>Children up to school age Childcare facilities for preschool aged children who are not old enough to attend primary or elementary schools (childcare centres, preschools, day-cares, nursery schools, and kindergartens if childcare)</p> <p>In the 13/15 diet-related studies total participants at baseline n=5620 (range 101-2658 children), # centres not recorded</p>	<p>Any intervention aimed at childhood obesity prevention with a controlled study design</p>	<p>PubMed, Web of Science, Cochrane Library, ERIC (n=4) Reviewed reference lists of included intervention studies and other relevant review articles</p>	<p>Jan 2000-Aug 2012</p>	<p>13/15 studies 12 RCTs-Cluster, 1 cluster-controlled design for diet-related</p>	<p>Any interventions aimed at childhood obesity prevention with; controlled study design (randomized or nonrandomized) ,outcome measures included adiposity (e.g., body mass index)</p>	<p>United States (n=4), Israel (n=3), Australia (n=1), Germany (n=2), France (n=1), Switzerland (n=1), China (n=1)</p>	<p>All studies rated high for performance bias, most others for attrition bias, one for selection bias. All low risk of bias for reporting.</p>

Abbreviations: CCT controlled clinical trial; ECEC Early Childhood Education and Care; FDC Family Day Care; PA physical activity; RCT randomised controlled trial

**Appendix-7: Table S4: Summary of the evidence from selected reviews using the JBI data extraction checklist (Johanna Briggs Institute 2014)**

Author/Year of publication	Outcomes assessed	Total number of primary studies included/  Significance/direction of included diet-related studies	Summary of findings of included studies	Underpinning theories stated in the reviews	Summary of research limitations and recommendations	Summary of practice recommendations of included studies
Bell & Golley 2015	<p><i>Primary</i> Children’s dietary intake</p> <p><i>Secondary</i> Centre environment Centre food provision/availability Parental food provision Child knowledge/attitudes/preferences Parent/knowledge Staff knowledge/attitudes/behaviours</p>	<p>25 studies</p> <p>Nearly all in the direction of nutritional improvement. Significance was <math>p &lt; 0.05</math></p>	<p><i>Primary</i> Studies effect on children’s dietary intake (8 out of 11 studies). Increases in fruit and vegetable consumption [5 studies] and decreases in ‘discretionary’ food or saturated fat intake [3 studies]</p> <p><i>Secondary</i> Studies with improvements in centres’ nutrition environments including policy, nutrition best practices (6/6), nutritional quality of centres’ menus (3/3), parental food provision (3/4 studies with three programs), child knowledge/attitudes/preferences (2/2), staff knowledge/attitudes/behaviours (4/4). 22/25 studies effective. Three studies were not: a pilot multi-component program, a program with a Latino population possibly because of low literacy skills, an intervention were the</p>	<p>9 interventions reported using BCT; SCT <math>n=7</math>, SEM <math>n=3</math> and SLT <math>n=3</math>.</p> <p>More than 9 theories are listed as some studies used more than one</p> <p>16/25 no theory reported</p>	<p>Evaluation of dietary intake beyond fruit and vegetables, and nutrient intake beyond fat and fibre was limited</p> <ul style="list-style-type: none"> <li>- outcome assessment beyond evaluation of the nutrition environment also limited</li> <li>- limitations include lack of comparison groups, poor intervention fidelity, selection and measurement bias, poor management of potential confounding in data analysis. However all RCTs or derivative and quality assessed.</li> </ul> <p>Recommendations</p> <ul style="list-style-type: none"> <li>- Underpin intervention design with theory</li> <li>- Strongest evidence relates to the nutrition environment of children in care. Less robust evidence exists on the potential to influence children’s dietary intake. Recommend evaluating the effect of changes to the nutrition environment on children’s dietary intake.</li> </ul>	<p>Support the proposition that ECS have good potential as avenues for effective nutrition promotion.</p> <ul style="list-style-type: none"> <li>- Environmental interventions can achieve improvements in determinants of children’s dietary intake.</li> <li>- Intervention development should continue as a priority to inform policy and practice.</li> <li>- Future intervention development needs to carefully consider the behavioural targets, modifiable determinants and utilise age-appropriate and effective behaviour change theory</li> </ul>

			shape of snacks was changed			
Hesketh & Campbell 2010	Child anthropometrics, diet, physical activity, or sedentary behaviour	3 studies  Effects favoured nutritional intervention groups, significance at $p < 0.05$	1/3 showed lower BMI increases at 1 and 2 years follow up Identical program with mainly Latino children no changes post intervention, or at 1 and 2 year F/U 2/2 studies significant decrease in total serum cholesterol but no impact on height to weight ratio <i>Diet outcomes</i> - 2/2 studies significant decrease in saturated fat and total fat in snacks, and corresponding reduction in intake	Not reported	-Most conducted in the USA - Failure to report cost-effectiveness data - Lack of reporting of theoretical base of interventions  Recommendations - Future research should build on and extend existing research activities	Include parental component and build knowledge and skills of carers and parents - Interventions which showed evidence of success were designed to impact not only on knowledge but also on skills and competencies suggesting a social behavioural theory underpinning
Ling & Wen 2016	Child anthropometry - BMI, BMI-P, BMI z-score, percent fat, skin-folds, waist circumference. Specific outcomes for diet not listed but included in this review as examined diet-related intervention characteristics	13 studies  Effects favoured intervention groups significance at $p < 0.05$ in some studies	6/13 studies effected measures of BMI -1/6 sig, effect BMI, BMI-P, percent fat -1/6 sig. effect compared to control in underprivileged areas -1/6 sig. effect in BMI, BMI-P at 12 month follow-up but not post-intervention -1/6 sig. effect at 12 mth, 24 mth F/U but post-intervention not reported -1/6 sig. effect on BMI-z, waist circumference -1/6 sig. effect percent fat, skin-folds, waist circumference but not BMI  12/13 studies included nutrition and a PA component. All of the studies which effected anthropometrics included both nutrition and PA components (n=6). Studies with PA only or nutrition	SEM (n=2), SCT and Zajonic's exposure effect (n=1), SDT (n=1), SDT and HBM (n=1), HBM and competence motivational theory (n=1) GST (n=1)  6/13 no theory reported	Recommendations Future research should examine the effects of demographics (gender, ethnicity, SES, parental education, marital and employment status) on intervention effects - Meta-analysis required to explore moderator effects, publication bias and small-study effects - Cost-effectiveness data should be reported -Providing preschool teachers with a health promotion opportunity to enhance their health knowledge, increase healthy behaviours, and reduce stress can increase program fidelity and quality	-Including a health-promoting component for preschool teachers in an intervention for preschool children may be warranted in future studies - Incorporating SCT-based strategies in future interventions may be a fruitful approach to prevent overweight/obesity in preschool children: (a) providing behavioural training to increase skill development (b) emphasizing feelings of mastery (c) setting short- and long-term goals (d) increasing self-efficacy and self-regulation through individualized positive feedback

			<p>only (n=1) had no significant effect.</p> <p>From the studies which influenced weight status, success was associated with: consistent messages through educational material across home and childcare; capacity building of parents; parents encouraged children to drink water; parental satisfaction and participation</p> <p>10/13 had active parental involvement. Lack of parental involvement may account for limited success in all studies</p> <p>11 of 16 studies (including 3 studies examining PA only) were educator delivered. May affect program fidelity as only 5 programs effective.</p>			<p>(e) role-modelling or providing opportunities for observational learning</p> <ul style="list-style-type: none"> <li>- Teaching preschool children and their families about the benefits of healthy eating and physical activity and targeting both nutrition and physical activity is recommended in future intervention work</li> <li>- Future prevention interventions in preschool children should : <ul style="list-style-type: none"> <li>- target both parents and children through interactive education and behavioural therapy with parents</li> <li>- use age-appropriate interactive education and hands-on experiences with a focus on physical activity and nutrition with children</li> </ul> </li> </ul> <p>(although intervention effects were less than optimal)</p>
Mikkelsen et al 2014	<p>Anthropometrics</p> <ul style="list-style-type: none"> <li>- BMI, z-scores for height and wt, weight to height measurements, serum cholesterol, skin-folds, prevalence obesity and o/w</li> </ul> <p>Dietary</p> <ul style="list-style-type: none"> <li>- Food consumption patterns, food preferences, willingness to try foods, Knowledge and attitude</li> </ul>	<p>26 studies</p> <p>Most in the direction of nutritional improvement and significance at <math>p &lt; 0.05</math></p>	<p>Healthy eating interventions increased fruit and veg consumption and nutrition related knowledge.</p> <p><i>Single exposure interventions</i></p> <ul style="list-style-type: none"> <li>- no studies had an effect on vegetable intake</li> <li>- some effect for fruit intake</li> </ul> <p><i>Educational interventions</i></p> <ul style="list-style-type: none"> <li>- 1/11 lower BMI and BMI-P in intervention group at follow up</li> <li>- 1 increase in fruit and vegetable consumption (5 others showed increase but not significant)</li> </ul>	<p>6 used SCT or SLT, 2 used Piaget's developmental theory, 1 listed theory of multiple intelligences and 1 Zajonc's exposure theory</p> <p>16/26 no theory</p>	<p>Recommendations</p> <p>Longer follow up in studies required</p> <ul style="list-style-type: none"> <li>- outcomes should include intermediate measures such as knowledge and consumption, not just BMI to measure effectiveness</li> <li>- development of innovative data collection methods capturing whether children are able to express what they like to eat and food related knowledge is needed</li> <li>- include process evaluation beyond revising educational materials and monitoring</li> </ul>	<p>Single exposure strategy insufficient to increase vegetable consumption, educational component also required</p> <ul style="list-style-type: none"> <li>- the more comprehensive the intervention strategy, the more likely the intervention will be successful</li> <li>- interventions should be targeted towards disadvantaged groups through targeting relevant centres</li> </ul>

			<ul style="list-style-type: none"> <li>- 2 increased nutrition-related knowledge</li> <li>- 2 increased identification of fruits and vegetables</li> </ul> <p><i>Multicomponent interventions</i></p> <ul style="list-style-type: none"> <li>- 6/7 increase in fruit and vegetable intake</li> <li>- 1 decrease in relative risk of high serum cholesterol</li> <li>- 1/1 increase in familiarity with novel foods</li> </ul> <p>No significant effect on anthropometrics Multi-component programs most effective</p>		<p>compliance. Need to focus on implementation drivers and barriers to increase understanding of what makes an intervention work</p>	<ul style="list-style-type: none"> <li>- target consumption of healthy foods and increasing knowledge of healthy eating</li> <li>- interventions more likely to be successful when taking actions on several levels into account</li> <li>- Evidence that ECEC interventions reduce inequalities in health as positive results with fruit and veg</li> </ul>
Morris et al 2015	<p>Anthropometric</p> <ul style="list-style-type: none"> <li>- BMI, BMI z-score</li> <li>- percentage body fat</li> <li>- waist circumference</li> <li>- % body fat</li> </ul> <p>prevalence of overweight/obesity</p> <p>Dietary intake</p> <ul style="list-style-type: none"> <li>-fruit and vegetable consumption, consumption of EDNp foods, consumption of water</li> <li>-</li> <li>- % calories from fat</li> <li>- nutrient content in meals</li> </ul> <p>Nutrition knowledge and attitudes</p> <ul style="list-style-type: none"> <li>- parents</li> <li>- children</li> </ul> <p>Environment</p> <ul style="list-style-type: none"> <li>- menu changes</li> </ul>	<p>12 studies</p> <p>Direction of change for dietary results reported for 7 of 12 studies. Others not reported.</p>	<p>Positive weight changes in 6 studies</p> <ul style="list-style-type: none"> <li>-6 reduction in overall or subgroup BMI</li> <li>- 1 reduction in incidence of overweight</li> <li>- 2 no changes in anthropometry despite change in parental and child knowledge and attitudes and child unhealthy-diet behaviours</li> <li>- 1 no change in anthropometric or dietary outcomes</li> </ul> <p>Secondary outcome relating to HE seen in all included studies</p> <ul style="list-style-type: none"> <li>-significant improvement in fruit and vegetable and/or improvements in ‘reduction of EDNP foods’ and increased drinking of water reported for 7 studies.</li> </ul> <p>Outcomes not reported for other 5 studies where it was also examined.</p>	<p>3 SEM, 2 SCT, one each of: self-determination theory, HBM, motivational theory, not specified theories of early childhood development, Bandura social learning theory, Zarjonic exposure effect, TTM</p> <p>5/15 no theory</p>	<p>High attrition was a problem</p> <ul style="list-style-type: none"> <li>- Requiring parental attendance reduced compliance</li> <li>- Parental confounders not controlled or adjusted for</li> <li>- Self/parental report of outcomes a limitation</li> <li>- However all RCTs or derivative and quality assessed.</li> </ul> <p>Recommendations</p> <p>Small amount of parental engagement around the curriculum (only 2/13) highlights significant area for future research in collaborative parental involvement</p> <p>Future interventions must plan, implement and evaluate any parental intervention conducted with an ECEC service.</p>	<p>Interventions should include communication with parents on classroom activities and content and include a better understanding of collaborative parental engagement</p> <ul style="list-style-type: none"> <li>- Capacity building of parents, educators and communities contributes to positive BMI outcomes</li> <li>- Interventions should adequately plan and examine ways to increase parental satisfaction and therefore engagement in interventions</li> <li>- ECEC educators have a role in inviting parental participation</li> </ul>

Nixon et al 2012	<p>Child anthropometry - weight, BMI, BMI z-scores, weight or overweight/obese classification status, skin-fold measurements, or waist circumference</p> <p>Dietary - fruit and vegetable intake, intake of water and beverages, snacking behaviour, and nutrient intake</p>	<p>4 studies</p> <p>Effects favoured all diet-related intervention groups, significance at <math>p &lt; 0.05</math></p>	<p>Child anthropometry - 2/4 showed weight changes</p> <p>Dietary - 4/4 showed improved dietary behaviours</p> <p>Overall, interventions that combined high levels of parental involvement and interactive school-based learning plus targeted dietary change and included long term follow-up were most effective</p> <p>Rated level of parental involvement as high, medium, low.. All 4/4 diet-related studies had a significant outcome and high parental involvement.</p>	<p>SLT (n=1), Self-determination Theory + SLT (n=1), HBM (n=1), no theory listed for one study</p>	<p>Recommendations Future research should focus on interventions that impact the built environment - Should ensure evidence base is driven by user involvement and children's views</p>	<p>Behavioural change strategies are key, rather than the use of specific behavioural models - high parental involvement and programmes targeting both dietary and PA changes - focus on developing children's (and parents') perceived competence at making dietary and physical changes, by implementing one or more of:</p> <ol style="list-style-type: none"> <li>1. Developing skills and behavioural capability</li> <li>2. Developing self-efficacy</li> <li>3. Educating parents and children (in classroom-based and/or practical sessions) about the benefits of healthful dietary and PA behaviours</li> <li>4. Modelling healthful eating and PA.</li> </ol> <p>Need to explore changing environment to support diet rather than behavioural approaches aimed at the individual. Need to ensure evidence base is driven by user involvement</p>
Sisson et al 2016	<p>Diet - food intake at home/care, beverage intake at home/care,</p> <p>Environment - menus, policies, staff/parent behaviours</p>	<p>45 studies</p> <p>Majority in the direction of nutritional improvement and significance was <math>p &lt; 0.05</math></p>	<p>Diet - 39/45 showed an effect in at least one nutrition outcome (87% desired effect)</p> <p>-Child care centre policies and practices can be improved by intervention, demonstrating the environment is amendable</p>	<p>SCT (n=13), SEM (n=9), other theory (n=9),</p> <p>No theory (n=14)</p> <p>25/29 diet related studies based on behavioural theory had desired dietary behaviour change</p>	<p>-Lack of consistent outcome measures</p> <p>Recommendations -Use RCT and behavioural theory to influence obesity outcomes -To sustain changes in children, need to emphasise parental involvement and</p>	<p>Multi-level approach (child, environment), multi-component re weight (diet and PA) recommended -focus on child care environment, including technical support and training -focus on child including educational component</p>

			to change, although environment-level only interventions had less impact on child health behaviour outcomes than those that specifically included child-level interventions		include behavior change strategy (SEM, SCT) -Consider changes to control groups too (no changes with intervention but undesirable changes with control) -Measure child's dietary changes as well as environmental changes for impact	-include parental involvement as correlated with favourable changes -inclusion of behavioural change strategy eg SCT or SEM
Ward, S et al 2015	Dietary intake - fruit and vegetable consumption - healthy food consumption -willingness to try or consume new foods	5 studies  All in the direction of nutritional improvement (increases in fruit and vegetable consumption), and significance was p<0.05	5/5 reported positive changes in dietary intake - increased intake of new foods - increased intake of fruits and vegetables - increased intake and acceptance of healthy food/snacks	Not reported. Theory of observational learning suggests children's behaviour shaped by watching educators.	Lack of representativeness of the target population - Low response rates - Lack of reporting of randomisation and blinding - Tools for primary outcome measures not described as valid, or were not reported in the study or in a separate study. - 4/5 studies published before 2000 - Most published in USA- Inadequate description of sample  Recommendations More/better quality research required to provide recommendations for practice -reassess interventions in today's changed environment and with more reliable measures -use larger and more diverse populations -explore effect of children preparing food or informal conversations during about food -assess how peers who are picky eaters influence children's intake -ensure representativeness, increase length of follow-up,	Weak evidence that educator practices positively influence preschoolers' eating behaviours - Educators can play a role in promoting healthy eating behaviours in children in childcare  Despite weak evidence that educators' positively influence children's eating behaviours, educators have a crucial education role and have a role promoting new guidelines  Involving peers as change agents for positive eating is recommended

					use valid reliable and objective measurement tools, ensure reliability and validity of tools reported	
Ward S, et al 2016	<p>Dietary intake/choice</p> <ul style="list-style-type: none"> <li>-fruit and vegetable consumption</li> <li>- healthy food consumption</li> <li>-</li> <li>Food preference/acceptance</li> <li>- ‘</li> <li>-willingness to try or consume new foods</li> </ul>	<p>7 studies</p> <p>All in the direction of nutritional improvement, and significance was <math>p &lt; 0.05</math></p>	<p>Social influences particularly modelling was a strong determinant of individual's food intake</p> <ul style="list-style-type: none"> <li>-Moderated by age, gender, perceived personality of role models</li> <li>- in 2 studies choice of non-preferred food increased</li> <li>- Increased intake of target foods</li> <li>- More bites of new foods</li> <li>- Increased acceptance of new foods</li> <li>-increases in fruit and vegetable consumption</li> </ul>	<p>Not reported</p> <p>Concept of social facilitation and observational learning theories suggested as relevant</p>	<p>:</p> <ul style="list-style-type: none"> <li>- Convenience sampling and lack of report of response rates suggests poor representation of target population</li> <li>- Low response rates</li> <li>- Lack of information on validity and reliability of outcome assessment tools</li> <li>- Missing numbers of withdrawals and dropouts</li> </ul> <p>Recommendations</p> <p>Recommend high-quality RCTs with larger sample sizes using reliable and validated tools</p>	<p>Weak evidence that peers influence pre-schoolers' eating behaviours.</p> <ul style="list-style-type: none"> <li>- Future obesity prevention interventions aiming at reaching a large number of children should consider involving peers as agents for positive eating behaviours in pre-schoolers.</li> </ul>
Ward D, et al 2016	<p>Child anthropometry</p> <ul style="list-style-type: none"> <li>-BMI, body fat, waist circumference, waist-to-height ratio, weight, MUAC</li> <li>Dietary intake</li> <li>-</li> <li>-fruit and vegetable consumption</li> <li>- food and beverage consumption</li> </ul>	<p>18 studies</p> <p>Majority in the direction of nutritional improvement, and significance was <math>p &lt; 0.05</math></p>	<p>Dietary intake</p> <ul style="list-style-type: none"> <li>- 13/18 showed at least one positive effect</li> <li>- 5/18 no change.</li> <li>-some didn't achieve results in every variable measured but only within some specific food groups or nutrients such as fruit, vegetable, sugar.</li> <li>- all four intervention measures (ie intervention strength, parental engagement, study quality, intervention elements) negatively correlated for healthy eating intervention strength and dietary intake outcomes</li> <li>-possibly due to small under-powered numbers, outliers or multi-component interventions and complex policy and environmental</li> </ul>	<p>Not reported for 13 studies</p> <p>Generally consistent with ecological models of behavior (SEM) and recommendations from authoritative groups favouring multi-level comprehensive interventions (</p>	<p>Recommendations</p> <p>Extent and quality of intervention implementation should be addressed, including the role of intervention complexity.</p> <ul style="list-style-type: none"> <li>- Anomalous findings regarding intervention strength and behavioural outcomes should be examined further.</li> <li>- Feasibility and effectiveness of single-behaviour versus combined physical activity and healthy eating interventions requires more focused study.</li> <li>- Future research should use and improve the developed intervention strength scoring system</li> <li>- It may be more productive to evaluate improved implementation</li> </ul>	<ul style="list-style-type: none"> <li>- Stronger interventions, with parent engagement and environmental and policy components tend to be positively related to anthropometric outcomes</li> <li>- Comprehensive, multi-level obesity prevention interventions in ECEC are recommended</li> </ul>



			<p>changes over time may be difficult to implement. -made more difficult if delivered by child care staff.</p> <p>-Authors hypothesize that comprehensiveness may be negatively associated with feasibility or fidelity of implementation</p> <p>HE and parental involvement correlated with favourable anthropometric outcomes</p> <p>However study design not correlated with HE outcomes Also no correlations between HE intervention strength (calculated by authors using own system) and HE outcomes, with or without parental engagement</p>		<p>of already-effective interventions than to study novel combinations of intervention strategies</p> <p>New hypothesis; more complex the intervention the less likely to be feasible or have fidelity, particularly if educator led</p>	
Wolfenden et al 2016	<p>Weight status</p> <ul style="list-style-type: none"> <li>- BMI z-score</li> <li>- weight to height ratio</li> </ul> <p>Childcare staff knowledge, skills, attitudes</p> <p>Dietary intake</p> <ul style="list-style-type: none"> <li>-fruit and vegetable consumption</li> <li>- food and beverage consumption</li> <li>-energy, macronutrient intake, intake of key micronutrients</li> <li>Types of foods provided</li> <li>-</li> </ul>	<p>8 studies</p> <p>Significance was <math>p &lt; 0.05</math> in the same direction for majority of diet-related interventions</p> <p>.</p> <p>.</p>	<p>Weight status</p> <ul style="list-style-type: none"> <li>- 1 reduced centre-level BMI z-score in intervention group, no difference in proportion of children in BMI groupings</li> <li>- 1 no change in weight height ratio</li> <li>-1 providing intensive intervention support in NAPSACC programs resulted in decreased child body mass index (BMI) z-score</li> </ul> <p>No intervention improved the implementation of all policies and practices targeted by the implementation strategies</p>	<p>3/8 were theoretically based: 2 components of social cognitive theory against a social-ecologic framework, 1 x practice change and capacity building</p> <p>5/8 not reported</p>	<ul style="list-style-type: none"> <li>- Lack of blinding of participants and personnel but this is difficult in real-world conditions</li> <li>- Use of self-assessment outcome measures a limitation</li> <li>- Lack of prospective registration of trials a limitation</li> <li>- Lack of consideration of power in sampling and small sample sizes a limitation</li> <li>- Cost of implementation not assessed</li> <li>-However all RCTs or derivative, quality assessed as part of Cochrane review</li> </ul>	<p>Uncertain whether the strategies tested improved the implementation of policies, practices or programmes that promote child healthy eating, physical activity and/or obesity prevention.</p> <p>Highlights dearth of guidance available for policy-makers and practitioners interested in supporting HE implementation strategies in centre-based childcare</p>

			<p>relative to a comparison group.</p> <p>Dietary intake  -1 intervention decreased energy, fat, saturated fat, fat as a percentage of energy and saturated fat as a percentage of energy at 6 months  - 1 intervention decreased saturated fat, fat as a percentage of energy and saturated fat as a percentage of energy at 18 months  - 1 intervention increased intake of iron and magnesium at 18 months</p> <p>Types of food provided  -studies, positive changes in types of food provided  -studies positive changes in types of foods selected.  -studies positive changes in types of food served to children as part of a multi-component intervention or staff wellness program (n=2) relative to control services.  -studies effects also reported for energy and fat following one-day workshop to cooks by dietitian and within group changes to all types of food provided following two training support strategies (n=1)  -multi-component strategies targeting the foods provided and including implementation support through training likely to be effective n=3</p>		<p>Recommendation  - include cost-effectiveness studies  - Formative work required to determine barriers to implementation of programs  -include more high quality RCT with larger sample sizes using validated measurements and tools</p>	<p>Institutional changes recommended; policy, health promotion, educational, curriculum, training staff</p> <p>Use of comprehensive theoretical frameworks to consider a broad range of implementation barriers when designing implementation support strategies</p>
--	--	--	---	--	--	--

			<p>Other</p> <ul style="list-style-type: none"> <li>- 1 no difference in staff knowledge or attitude</li> <li>- - Evaluation reported improvements in HE and PA policies but not in HE or PA practices (providing more support for strength of policies)</li> </ul>			
Zhou et al 2012	<p><i>Primary</i> Adiposity, measured as BMI, BMI z score, waist circumference, skin-fold thickness, or percent overweight or obese. <i>Secondary</i> Dietary and physical activity behaviours,</p>	<p>13 studies</p> <p>Intervention group vs. control group, significance was <math>p &lt; 0.05</math> for the majority of studies</p>	<p>Childhood obesity prevention interventions were variably effective in improving adiposity, dietary behaviours</p> <p>11/13 diet-related studies had significant. changes to adiposity and/or diet</p> <p>Studies with studies changes in adiposity had diet <b>and</b> PA component (single component e.g. diet or PA only not studies. for changes in adiposity) 7/7 studies with sig changes to wt status included dietary-component, but 4 didn't record/measure diet outcomes</p> <p>6/13 diet-related studies reported improvement in dietary intake in intervention groups versus control groups, including lower percentage of calories from saturated fat, higher intake of fruit and vegetables, fewer unhealthy lunch items, and increased frequency of eating breakfast.</p>	<p>Social cognitive theory (social learning theory) n=3 Zajonc's exposure effect n=1 health belief model n=1 competence motivational theory n=1 reinforced learning theory=1 self determination theory n=1</p> <p>5 no theory stated</p>	<p>-Limitations include short intervention duration and short follow-up time period limiting sufficient intervention exposure and/or sufficient follow-up time to detect changes in adiposity beyond any intermediate behavioural changes. -large variety of subjective measures for the secondary outcomes of diet, self-reports and 24-hr dietary recall -sub-group analysis or studies with very diverse groups culturally and SES. cautions use of generalisability and transferability to different pops.</p> <p>Recommendations More research on interventions to improve the nutrition environment in preschool settings -further test multi-strategy approaches -use consistent outcome measures - apply more narrow eligibility criteria for meta-analysis as more RCTs of</p>	<p>Interventions that incorporate institutional changes are important for sustainability, such as policies, age appropriate health promotion education curricula, and professional training of preschool staff.</p>

			Interventions that affected the environment (n=3 studies) were potentially sustainable by initiating institutional changes		childhood obesity interventions in childcare settings become available - focus on targeting interventions to meet the needs of children from diverse cultural and socioeconomic backgrounds - include cost-effectiveness analysis of the intervention strategies and outcomes	
--	--	--	--	--	---	--

Abbreviations: BCT behaviour change theory, BMI body mass index, BMI-P body mass index percentile ECS Early Childhood Service, FFQ food frequency questionnaire, F/U follow-up GST generalised system theory HBM health belief model, HE healthy eating, MUAC mid-upper arm circumference NAPSACC nutrition and physical activity self-assessment for child care , OW overweight, SCT social cognitive theory, SEM socio-ecological model, SLT social learning theory, TTM transtheoretical model of change, Wt weight

**Appendix-8:** Codebook example for coding of directors’ interviews in 13 centre-based childcare centres, South Australia, 2018 (downloaded from NIVO-11)

Code	Description	Sources	References
Directors- characteristics and intrapersonal	Behaviours, personal qualities and beliefs including perception of role (professional role, professional identity and boundaries, organisational commitment, leadership) and stated beliefs (beliefs related to capabilities, beliefs related to outcomes, beliefs related to nutrition)	• 13	• 325
Directors-experience	Characteristics of the directors and centres eg: number of years working as a director, education level, number of childcare places provided, organisation that owns the centre, not-for-profit	• 13	• 50
Directors- beliefs	Beliefs about nutrition, beliefs about outcomes (acceptance about the outcomes of a behaviour in a given situation including outcome expectancies, consequents, perceived competence, self-efficacy, perceived agency, professional confidence) and beliefs about capabilities (acceptance of talent and abilities directors can put to constructive use)	• 13	• 144
Directors- roles	Behaviours, personal qualities and beliefs related to directors' perception of their role (including professional role, professional identity, professional boundaries, organisational commitment, leadership)	• 13	• 120
Director’s role pivotal	Response to the question of what enables the promotion of healthy nutrition in their centre which they have described. This question was introduced after the sixth interview.	• 8	• 31
Directors-advocacy role	Any behaviours, intentions, goals or beliefs relating to advocating for nutrition in children including reference to personal qualities, being a change agent and initiatives outside of the centre (eg: with parents, the community, policy level, wider sector)	• 9	• 30
What does healthy eating mean (knowledge)	Explanation of what healthy eating means given by the Director	• 13	• 54

Code	Description	Sources	References
Whose responsibility	Responsibility stated or assumed relating to children's nutrition	• 12	• 51
Children's agency	Any activities, approaches or reference to the environment that encourages or gives children a voice or decision-making capabilities or facilitates children to do the task themselves	• 8	• 40
Children's rights	Responses to the question or comments that relate to children's rights and entitlements within nutrition-context	• 9	• 33
Constraints	Any barriers mentioned which prevented, restricted or compromised the goal to provide children in childcare nutritious food which met their developmental and health needs and helped foster healthy food preferences and food habits. Barriers could relate to the food environment (provision of food, menus), social environment (modelling, mealtime behaviours), information environment (training, knowledge). Barriers/challenges could also relate wider eg policy-environment	• 13	• 188
Constraint -training	Any comments made which identified the lack of nutrition-related training or professional education as a barrier or comments about the limitations of provided training/professional education eg: accessibility, availability, mode of delivery, affordability	• 7	• 16
Constraint-no srer	Any comments acknowledging the absence or consequences of the absence of previously provided multi-strategy nutrition incentive initiative, Start Right Eat Right. This initiative ceased in 2013 after 13 years of implementation across SA.	• 3	• 4
Constraints-food environment	Any barriers mentioned which prevented, restricted or compromised the food environment and the goal to provide children in childcare nutritious food which met their developmental and health needs and helped foster healthy food preferences and food habits.	• 12	• 134
Constraint-restrictive menu	Challenges presented by restricting the menu to cater for food allergies etc	• 4	• 5

Code	Description	Sources	References
Constraints-special diets	Comments which describe special diets as challenging eg: allergies, sensory integration diets, food intolerances	• 11	• 61
Constraint-timing	Mealtime or other practices which affect the timing of meals or provide pressure to rush meals	• 1	• 1
Constraint-changing family food preferences	Perceived challenges as a result of changing and increasing family food preferences different to what the menu provides eg: vegetarian meals, vegan meals, cultural food exclusions (pork, onion, garlic)	• 12	• 32
Constraint-cooks set in their ways	Comments referring to cooks' reluctance, ambivalence or resistance to suggested changes or changing trends	• 4	• 7
Constraint-foods unfamiliar	Comments relating to the behaviours of the children or responses of the centre to the provided food being different to that provided at home	• 7	• 25
Constraint-separating food into ingredients	Comments relating to the separation of a meal into separate ingredients such as plain pasta, bolognese sauce, peas, carrots.	• 6	• 10
Constraint-educators' attitudes	Comments from Directors where the educators' attitudes influence children's food choices	• 3	• 5
Constraints-other	Any barriers mentioned which prevented, restricted or compromised the goal to provide children in childcare with nutritious food which met their developmental and health needs and helped foster healthy food preferences and food habits. Barriers could relate to the food environment (provision of food, menus), social environment (modelling, mealtime behaviours), information environment training, knowledge). Barriers/challenges could also relate wider eg policy-environment	• 8	• 26
Enablers	Any enablers mentioned which facilitated the goal to provide children in childcare nutritious food which met their developmental and health needs and helped foster healthy food preferences and food habits. Enablers could relate to the food environment (provision of food, menus), social environment (modelling, mealtime	• 9	• 26

Code	Description	Sources	References
	behaviours), information environment (training, knowledge). Enablers could also relate wider eg policy-environment or relate to social influences (parents, children, educators)		
How HE supported in centre	Practices, policy or strategies which Directors' identified as supporting healthy eating in the centre	10	33
Suggested support	Suggestions from the directors on how the cook's role or nutrition in the centre can be strengthened	13	89
Enabler-more awareness and research	More awareness and research mentioned as an enabler	1	2
Enabler- cook training	Cook training stated as an enabler	6	16
Enabler-resources	Resources include menu planning guidelines, checklists and other written information resources that support childcare cook's practices	2	3
Food Environment	Any influences or behaviours related to the food environment including: preparation, provision and serving of food, menus, timing of meals, social influences (children's food preferences, parental influences), policy, capabilities to enact food-related practices (knowledge, skills, attitudes).	13	277
Food provision	Any influences or behaviours related to food provision including: purchasing, preparation, cooking and serving of food; menus, menu-planning, timing of meals,	13	136
Mealtime timing	Any comments relating to the timing of mealtimes or initiatives where the timing of mealtimes is intentionally regulated	3	7
Mealtime environment	Practices or children's behaviours relating to the mealtime environment eg: progressive mealtimes, eating together	9	25



Code	Description	Sources	References
Educators-social environment	Any interactions between the director and educators who work directly with the children or anything related to educators' perceived knowledge, skills, abilities (including attitudes, adaptive behaviours, interactions with children) or the food environment influenced by educators (serving of food, mealtimes, curriculum). Any barriers or facilitators that discourage or encourage the development of healthy food preferences and food habits in children or strengthen the provision of healthy food.	0	0
Educators and food	Any practices or outcomes relating to food and the educators who work with the children in the rooms	13	78
Enablers-educators	Practices, values, skills of the educators which facilitate or enable healthy nutrition	6	12
Interconnections	Comments which suggest connections between different levels of influence	9	31
Memorable quotes	Relevant quotes identified by the researcher to the research questions specified in the study	12	220
Parents and food	Any comments relating to parent's provision or views on food provided by the centre	13	113
Parents -communication and trust	Comments or strategies relating to engaging with parents and building trust	11	78
Parents- responsibility	Directors' perception of parent's responsibility relating to; the provision of food in the centre and outside of the centre, children's nutrition	7	12
Parents-strategies for home	Strategies which bridge what happens in the centre with regards to nutrition and with what happens at home.	9	46
Policy-influence	Relates to the centre's local healthy eating policy or the franchises (eg: G8, Good Start, Stepping Stones) or the EYLF (Early Years Learning Framework)	13	93

Code	Description	Sources	References
Policy- EYLF	Reference or comments relating to the Early Years Learning Framework. The Early Years Learning Framework ( EYLF ) describes the principles, practices and outcomes that support and enhance young children's learning from birth to five years of age	10	19
Policy-effectiveness	Comments relating to the effectiveness of the centre's HEP influencing food provision or nutrition practices or values	6	11
Policy-HEP	Evidence of the centre's healthy eating policy influencing food provision or nutrition-related practices in the centre	12	49
Policy-parents	Parent's response to the centre's nutrition and food policy for healthy food	4	10
Policy-privates ethos	Policy philosophy of private franchises influencing nutrition-related decisions eg: Good Start's focus on food security for families	2	4
Sector influence	ECEC factors influencing centre's goals, intentions or outcomes relating to nutrition	5	10
Community interaction	Examples or comments relating to engagement with the community and the centre eg: Food Bank, collaborations with local community group with vegetable garden	5	10
Wider influences beyond sector	Determinants wider than the centre that may influence the centre's support of children's nutrition eg; SES	6	36

**Appendix-9: Professional development suggestions and other solutions from childcare personnel**

	<b>Cooks</b>	<b>Directors</b>	<b>Influential decision-makers</b>
Individual level suggestions	<p>Computer literacy training</p> <p>Support hubs: networking with other cooks face-to-face; Facebook community of practice</p> <p>Shared understanding of nutrition's importance and currency of knowledge</p> <p>Professional development: menu planning, allergies, modifying menus, more culturally diverse recipes and how to prepare them, technical skills eg: catering for large quantities</p> <p>Peer-led training and education (eg: chefs sharing technical skills)</p>	<p>Affordable training and professional development; more availability of workshops and training e.g.: Gowrie SA is only offered annually and booked out</p> <p>Face-to-face training for cooks</p> <p>Cook hubs-networking with other cooks</p> <p>Closed and supported Facebook group</p> <p>Focus on mindset and attitudes with training (job is adult-focused, not child-focused, some cooks resistant to changes or set in their ways)</p> <p>How to teach the children eg: intentional learning at mealtimes, pedagogical lunches</p> <p>Nutrition-related training for educators who work with children is absent</p>	<p>Support and training for providers regarding own healthy eating and addressing 'baggage'</p> <p>Provide training that addresses misconceptions and beliefs</p> <p>Combine use of social media channels with interpersonal interaction in online learning</p> <p>Incentivise</p> <p>Train educators too (crucial)</p> <p>Align training with the National Quality Framework and ethos. Crucial that staff know how to support children and their families within this framework.</p> <p>Leadership support and commitment crucial</p>
Structural solutions		<p>Establish an Advisory Service similar to interstate</p> <p>Add attributes such as 'flexibility', 'passion' to cooks job &amp; person specifications (J&amp;P)</p> <p>Employ chefs who have technical skills to provide for large numbers and upskill in nutrition for children</p>	<p>Have a designated cook</p> <p>Increase minimal qualifications of cooks</p> <p>Establish an Advisory Service similar to interstate</p> <p>Advance the role and scope of cooks/chefs beyond food provision</p>

		<p>Extend scope of cooks/chef so they can be part of the teaching team e.g.: attend staff meetings, cook with the children, grow veg with the children</p> <p>Develop responsive, flexible menu planning guidelines and resources</p> <p>Employ cooks 9 am-5 pm to remove pressure to rush meals so can clean-up in time</p> <p>Support progressive mealtimes</p> <p>Support mealtime routines like those at home (e.g. mid-meals not common)</p>	<p>Create a Department of Education project officer to whom centres are accountable</p> <p>Partner with a nutrition-focused association which is credible and a 'go-to'</p> <p>Add micro-qualifications to eg: cooks J&amp;P</p> <p>Access to nutrition experts</p> <p>Provide nationally consistent resources eg: menu planning guidelines</p> <p>Provide national approaches as accreditation and the accrediting body ie ACECQA is national (individual jurisdictions are confusing)</p>
Cross-setting suggestions		<p>Institute strategies with parents that relieves burden caused by pressures of work/life and is educational ego: meal packs, 5-min recipe rescue</p> <p>Provide an app for parents about their child's diet</p> <p>Provide regular e-newsletters</p> <p>Provide nutrition-related displays in the centre as means to communicate with parents, create conversations</p> <p>Make available free and easy access to nutrition information and resources</p> <p>Give access to centre's recipes</p> <p>Develop a cookbook for the centre for families</p>	Help families and parents

		<p>Provide free education for parents such as online webinars, online cooking demos, workshops</p> <p>Invite parents to access experts visiting the centre eg: dental visits</p> <p>Connect with local community groups and cook take-home meals for busy parents</p> <p>Partner with supermarkets or speciality shops and provide tours by retailers</p> <p>Add familiar foods from home to the menu</p>	
Societal and governmental suggestions		<p>Advocate for the children's nutrition</p> <p>"Make a change. Thank you" Director</p> <p>Many services want more connections with their community</p> <p>Government needs to take more responsibility and resource nutrition-related strategies</p>	<p>Healthy eating education for the wider population-"haven't been successful"</p> <p>Government needs to take more responsibility and provide resourcing. Most services are individual businesses which with a neo-liberal government is a barrier to government support</p>

**Appendix-10:** Current nutrition-related programs supporting centre-based childcare services in Australian states and territories, 2019

State or Territory	Title of service	Organisation and funders	Cost	Initiatives and programs available
Australian Capital Territory (ACT)	ACT Nutrition Support Service	Nutrition Australia ACT & ACT Government	Fee-for-service, service subscription	Nutrition and Food Handling Course Menu Assessments (written) Site visit menu assessments
NSW	<i>feedAustralia</i>	University of Newcastle, Hunter New England Population Health and Healthy Australia.	Free	Online toolkit including online menu planning tool and nutritional information Cooks Club
	<i>Munch'n'Move</i>	NSW Ministry of Health, NSW Department of Education, Office of Sport and the Heart Foundation.	Free	Munch & Move program including professional development training, resources, support to develop policies, family-focused support materials, access to expertise Healthy menu planning workshops Caring for Children: Birth to 5 years (Food, Nutrition and Learning Experiences) resource
Northern Territory	Health Promotion Strategy Unit	Health Promotion Strategy Unit, Northern Territory Government	Free	Long Day Care Menu Planner
Queensland	Food Foundation,	NAQ nutrition (formerly Nutrition Australia Queensland)	Fee-for-service, service subscription,	INSPIRE nutrition education program for regional Qsld supported by Queensland Government Training & workshops (menu planning, food safety, allergies) Subscriber service: Food Foundations-Early Years Nutrition Free resources for downloading

Tasmania	<i>Move Well Eat Well, Early Childhood</i>	Funded and managed by the Health Improvement Public Health Services, the Department of Health & Human Services	Free	<i>Move Well Eat Well Award</i> includes: Nutrition courses Menu Assessments Supporting resources including curriculum guides, policy templates Newsletters A whole-of-service, simple framework for planning and action
Victoria	Healthy Eating Advisory Service (HAES)	Nutrition Australia Vic Division, with support from the Victorian Government.	Achievement Program Free, Fee-for-service for Long Day Care Menu Service or training, Fee for service subscription	Achievement Program supported by Vic Government (free) Menu planning resources Menu assessments (FoodChecker) Menu Planning Guidelines for Long Day Care Menu Planning Checklist for Long Day Care Online nutrition training Workshops Supporting resources including healthy eating activities and cooking with children
SA	Cooks Day Out	Gowrie SA,	Free	Workshop and training twice a year, themed around what centre-based childcare services want
Western Australia	SNAC (Supporting Nutrition for Australian Childcare)	Edith Cowan University, Nutrition & Dietetics, Australian Health Promotion Foundation (Healthway)	Free	Online curriculum with professional development and resources to teach healthy eating Resources downloadable from website