Embedding children's health behaviour screening within routine primary health care as a strategy to support growth, health, and development in the early years

By

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BNutDiet(Hons)

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I would like to acknowledge the Kaurna people, the traditional owners and custodians of the unceded land where this research is being conducted, and respect their cultural, spiritual, physical, and emotional connection with their lands and community. I pay my respects and honour their Elders past, present, and emerging.

I also acknowledge and respect First Nations people as our first scientists and researchers.

I live and learn on Kaurna land.

CONTENTS

ABBREVIATIONS

Abbreviations

ABS	Australian Bureau of Statistics
ACCHS	Aboriginal Community Controlled Health Services
AIHW	Australian Institute of Health and Welfare
CaFHS	Child and Family Health Service
CDC	The Centre for Disease Control and Prevention
DoH	Department of Health
ECEC	Early Childhood Education and Care
GP	General Practitioner
KTA	Knowledge to Action
MBS	Medicare Benefits Schedule
MCaFHNA	Maternal, Child and Family Health Nurses Australia
NGT	Nominal Group Technique
NDIS	National Disability Insurance Scheme
NHMRC	National Health and Medical Research Council
NIPS	National Immunisation Program Schedule
PHC	Primary Health Care
PHN	Primary Health Network
RACGP	The Royal Australian College of General Practitioners
RCT	Randomised Controlled Trial
SA	South Australia
SIDS	Sudden Infant Death Syndrome
UK	United Kingdom
US	United States of America
WHO	The World Health Organisation

GLOSSARY

Caregiver	Any person(s) primarily responsible for the care of young children, including all types of parents (e.g., biological, step) and caregivers (e.g., foster care, grandparents, extended family member). This does not include formal paid or occasional care providers (e.g., childcare educator, extended family). A primary caregiver is anyone who self-identifies as a primary caregiver [1].
Dietary intake	The quantity, quality, and frequency of children's consumption of core and non-core foods and beverages [2]. Also includes breastfeeding, formula feeding, and introduction of solid foods in infancy (age <12 months) [3].
Early years	Birth to five years of age
Early Years System	The universal and targeted government and non-government policies, programs, services, and supports available to children from birth to five years, and their families [1, 4, 5].
Growth monitoring	Routine measurement and recording of a child's weight and/or height, plotted on age- and sex-specific growth charts [6]
Health	A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity [7].
Health behaviour domain	Broad grouping of modifiable health behaviours within dietary intake, physical activity, sedentary behaviour, and sleep.
Health policy	Courses of action (and inaction) that affect the set of institutions, organizations, services, and funding arrangements of the health system (both public and private) [8].
Implementation Science	The scientific study of methods to promote the systematic uptake of research findings and other evidence-based practice into routine practice and, hence, to improve the quality and effectiveness of health services [9, 10].
Implementation strategies	Methods or techniques used to enhance the adoption, implementation, and sustainability of a clinical program or practice [11].

Integrated Knowledge Translation	A collaborative and participatory approach to research that engages and integrates key partners, is action-oriented, focused on solutions and impact, and applies the principles of knowledge translation throughout the entire research process [12-15].
Nominal Group Technique	An orderly, collaborative, consensus process designed to generate, filter, and prioritise ideas and solutions to questions posed to a small group of participants [16, 17].
Physical Activity	Movement of the body that uses energy over and above resting. For young children, this can include walking, crawling, running, jumping, balancing, climbing in, through and over objects, dancing, riding wheeled toys, cycling, jumping rope [18].
Primary Health Care	A whole-of-society approach to health that aims at ensuring the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment [19]
Primary Health Care Practitioner	Health professional working in a primary health care setting including general practitioners, nurses, allied health, pharmacists, and Aboriginal health and community health workers.
Sedentary Behaviour	Any waking behaviour characterised by an energy expenditure $\leq$1.5 metabolic equivalents, while in a sitting, reclining, or lying posture. For young children, this can include time spent restrained in a car seat, high-chair, stroller, pram or in a carrying device or on a caregiver's back. Includes time spent sitting quietly listening to a story and sedentary screen time (time spent passively watching screen-based entertainment) [18].
Sleep	Includes child sleep quantity, hours of total daily sleep duration, total minutes of sleep in 24-hour period, the average length of a sleep bout and duration of individual sleep bouts, average night-time sleep, sleep consecutive hours at night, rate of sleeping through the night [20].

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THESIS SUMMARY

Background

The first five years of life is a critical life stage of development, laying the foundation for lifelong health and wellbeing. During this time, children's modifiable health behaviours are established, including dietary intake, physical activity, sedentary behaviour, and sleep habits. These health behaviours can track into adolescence and adulthood, influencing health across the life course. The early years is therefore a critical time in which caregivers and health practitioners can support a child's growth, health, and development. Caregivers of young children frequently access Primary Health Care (PHC) providing an ideal setting and opportunity for early intervention and health promotion. Current recommended practice within PHC is to use growth-related measures, including height and weight, as a proxy measure for health. However, there can be substantial barriers to this approach including caregiver receptiveness, stigma, and impact on rapport. Pilot studies conducted internationally show that screening for a child's health behaviours in PHC is feasible accepted by caregivers and practitioners. However, the suitability of this approach within the Australian PHC system is unknown.

Thesis Aim

The aim of this thesis was to determine the feasibility and acceptability of embedding child health behaviour screening within routine Primary Health Care (PHC) as a strategy to support growth, health, and development in the early years (birth to five years).

Methods and Results

The epistemological framework to address the thesis aim was pragmatism. Pragmatism is a flexible and reflexive approach to research design, embracing both quantitative and qualitative methods. Pragmatism recognises that knowledge is both real and constructed, and is influenced by real-world experiences. Therefore, pragmatism provides the epistemological justification to inform the multi-method approach utilised in this thesis.

Study 1 was a scoping review of Australian PHC guidelines (n = 18) which aimed to identify and describe current advice and recommendations to support optimal growth, health, and development of children in the early years (birth to five years). The review demonstrated that Australian PHC guidelines recognise the importance of monitoring and promoting child health behaviours in routine

PHC, however there is currently a lack of practical guidance, tools, and resources to support practitioners to do this in practice.

Study 2 was a systematic review of existing child health behaviour screening tools (n = 14) used in PHC settings internationally. Review findings indicate that child health behaviour screening tools exist, and are acceptable and feasible in PHC, however none have been tested in an Australian PHC setting.

Study 3 involved workshops (n = 9) with PHC practitioners (n = 29) following the Nominal Group Technique (NGT) approach to identify and prioritise key features of a child health behaviour screening tool and the supports needed to implement child health behaviour screening in PHC. Workshop findings demonstrate South Australian PHC practitioners are accepting of a child health behaviour screening, indicating that the tool must be easy to complete and understand, use inclusive and accessible language, and be appropriate for use across disciplines and sectors.

Study 4 was a multi-method pilot study which aimed to understand caregiver acceptability and feasibility of a child health behaviour screening tool within a multi-disciplinary PHC clinic. Survey and interview data demonstrate Australian caregivers are accepting of a brief electronic child health behaviour screening tool conducted in the waiting room prior to a PHC visit. Caregivers are interested in receiving screening tool results, as well as tailored health information, resources, and referrals following screening to support their child's growth, health, and development.

Conclusion

This research proposed a new universal and strengths-based approach to early intervention in the first five years of life, by testing the use of a child health behaviour screening tool in routine PHC. The findings of this thesis demonstrate alignment of child health behaviour screening with Australian policy, guidelines, and practice. This research generated new knowledge of the feasibility and acceptability of child health behaviour screening in Australian PHC, achieving the thesis aim, and contributing to the evidence base to take forward in future studies to establish effectiveness, initiating the path towards a change in PHC practice.

DECLARATION

I certify that:

1. this thesis does not incorporate material which has been accepted for the award of any other degree or diploma
2. the research within this thesis will not be submitted for any other future degree or diploma without the permission of Flinders University
3. to the best of my knowledge and belief, this thesis does not contain any material previously published or written by another person except where due reference is made in the body of the thesis, and.
4. if generative artificial intelligence has been used in my thesis it has been duly acknowledged with details to identify the extent to which generative artificial intelligence formed the final thesis

Signed: Dimity Dutch

Date: 20/08/2025

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It is an incredible honour and privilege to have completed my candidature within the Caring Futures Institute at Flinders University. Bright eyed and bushy tailed, I began my candidature in February 2022 with one goal in mind for my PhD: change the world. I am incredibly proud to be writing these acknowledgements in June 2025 as I prepare for my thesis submission. This thesis might not have changed the world entirely, but it is my important contribution, and it is all thanks to the incredible people that I have supporting me.

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1 SUMMARY

1.1 General background

The first five years of life is a critical life stage of development, laying the foundation for lifelong health and wellbeing. During this time, children's modifiable health behaviours are established, including their dietary intake, physical activity, sedentary behaviour, and sleep. These health behaviours can track into adolescence and adulthood, and influence health across the life course. The early years is therefore a critical time in which caregivers and health practitioners can support a child's growth, health, and development.

Caregivers of young children frequently access Primary Health Care (PHC) providing an ideal setting and opportunity for early intervention and health promotion. Current recommended practice within PHC is to identify children with inadequate or excess growth, as a proxy for poor health behaviours, based on height and weight measures plotted on growth percentile charts. However, there can be substantial barriers to this approach including caregiver receptiveness, stigma, and impact on rapport. Most importantly, supporting children's health behaviours is important regardless of growth.

This research proposes a new universal approach to early intervention in the first five years of life, by testing the use of a health behaviour screening tool in routine PHC. Existing research conducted internationally show that integration of nutrition and physical activity screening into PHC appointments is a feasible approach and accepted by caregivers and practitioners. The suitability of this approach within the Australian PHC system is unknown.

Embedding child health behaviour screening within existing health care delivery systems such as PHC, has potential to be a scalable, equitable, sustainable, and universal approach to support growth, health, and development in the early years, regardless of growth. The evidence generated from this research could further inform changes to practice guidelines for PHC, which currently focus on growth-related assessment, to focus on health behaviour screening in routine child health checks. Ultimately, this research will support PHC to undertake and prioritise effective initiatives to support child growth, health, and development in the early years.

1.2 Thesis Aim and Objectives

1.2.1 Thesis Aim

This thesis aims to determine the feasibility and acceptability of embedding child health behaviour screening within routine Primary Health Care (PHC) as a strategy to support growth, health, and development in the early years (birth to five years).

1.2.2 Thesis Objectives

1. Understand current Australian practice guidelines for PHC that provide recommendations for the monitoring and promotion of child health behaviours in the early years.
2. Identify and describe the effectiveness, acceptability, and feasibility of child health behaviour screening tools used in PHC settings.
3. Identify and prioritise PHC practitioner generated tool features and supports to implement and embed child health behaviour screening in PHC.
4. Understand caregiver perspectives, experiences, and acceptability of child health behaviour screening within PHC.
5. Develop and test a proof-of-concept child health behaviour screening tool for use in PHC.

1.3 Studies to address thesis aim and objectives

Study 1 aimed to identify and describe current advice and recommendations within Australian national, state and practitioner documents that guide Primary Health Care (PHC) practitioners to support optimal growth, health, and development of children in the early years (birth to five years).

Study 2 aimed to identify and describe screening tools used in PHC settings that measure health behaviours in children from birth to 16 years*.

Study 3 aimed to understand PHC practitioner generated solutions and strategies to embed early child health behaviour screening within routine PHC in South Australia.

Study 4 aimed to develop, and pilot test, a child health behaviour screening tool in PHC and explore caregiver acceptability.

*Focus on children aged birth to 16 years for Study 2 is explained in the respective chapter.

1.4 Thesis Structure

This thesis is structured into eight chapters. Each chapter includes an introductory paragraph that navigates the reader through the purpose of the chapter and references any publications generated from the chapter.

Chapter 2, Introduction, provides context for this PhD, and summarises the background evidence regarding the importance of the early years for establishing positive health behaviours, the rationale for Primary Health Care (PHC) being an ideal setting for early intervention and health promotion, and limitations and barriers associated with current recommended practice in PHC.

Chapter 3, Methods, provides an overview of the methodological approach and theoretical perspective to inform the studies within the thesis.

Chapter 4, Guideline Review, addresses Objective 1 and presents the results of Study 1, a scoping review of Australian PHC guidelines for child growth, health, and development.

Chapter 5, Systematic Review, addresses Objective 2 and presents the results of Study 2, a systematic review of screening tools used in PHC settings to identify health behaviours in children (birth to 16 years). Chapter 5 proposes child health behaviour screening as an alternative or complimentary approach to growth monitoring and provides a comprehensive overview of child health behaviour screening tools used in PHC that exist internationally.

Chapter 6, Practitioner Workshops, addresses Objective 3 and presents the results of Study 3, Nominal Group Technique workshops with Australian PHC practitioners. Chapter 6 describes practitioner generated features of a child health behaviour screening tool and implementation strategies to support uptake in routine Australian PHC.

Chapter 7, Pilot Acceptability Study, addresses Objective 4 & 5 and presents the results of Study 4, a pilot feasibility and acceptability study. This includes the co-design process to develop the child health behaviour screening tool and caregiver perspectives on resources required following screening.

Chapter 8, Discussion, summarises the key thesis findings and provides an overall general discussion and interpretation of the studies above. Chapter 8 articulates the key contributions to knowledge, strengths and limitations of the thesis, and implications for future research, policy and practice. Chapter 8 presents a comprehensive overview of potential implementation strategies and recommendations for further tool development and trial testing.

1.5 Original Contributions to Knowledge

This PhD provides several original contributions to knowledge in the field of early intervention and health promotion in the early years. This PhD aligns with national policy priorities in Australia, including the Early Years Strategy 2024-2034 [5] and National Preventive Health Strategy 2021-2030 [21], in addition to previously identified research priorities in childhood obesity prevention [22]. Underpinned by the Knowledge-to-Action Framework [23], this PhD identifies and creates new knowledge, recognising the importance of practitioner and caregivers perspectives and tailoring knowledge to context.

This PhD proposes a novel and potentially more effective approach to early intervention and health promotion within Australian Primary Health Care (PHC) to support children's growth, health, and development by screening children's health behaviours. The research within this PhD will support a greater understanding of the current recommendations for health behaviour screening provided in Australian practice guidelines and identify areas for improvement to better support practice. This PhD also provides new knowledge on the alignment of child health behaviour screening within PHC, as well as caregiver and practitioner perspectives on this novel approach in practice. This is also the first body of research to develop and test a comprehensive fit-for-purpose child health behaviour screening tool in Australian PHC, providing crucial evidence of its feasibility and acceptability in routine practice. These are all original contributions to knowledge, establishing the evidence to take forward to future studies to determine effectiveness and implementation, starting the path towards a change in practice in Australian PHC.

1.6 Publications and Presentations during Candidature

1.6.1 Thesis publications

Study 1 (Chapter 4)

Dutch D, Bell L, Hunter S, Johnson J, Denney-Wilson E, and Golley K. Australian Primary Health Care guidelines for childhood growth, health, and development in the early years: A scoping review. *Australian and New Zealand Journal of Public Health*. 2025; 49(3): 100248. https://doi.org/10.1016/j.anzjph.2025.100248

Study 2 (Chapter 5)

Dutch D, Bell L, Zarnowiecki D, et al. (2024) Screening tools used in primary health care settings to identify health behaviours in children (birth–16 years); A systematic review of their effectiveness, feasibility and acceptability. *Obesity Reviews.* e13694. https://doi.org/10.1111/obr.13694

Study 3 (Chapter 6)

Dutch D, Hunter SC, Bell L, Manson AC, Denney-Wilson E, Golley RK. Child health behaviour screening in Primary Health Care: Nominal Group Technique workshops with Australian practitioners *(under review with Primary Health Care Research & Development)*

Study 4 (Chapter 7)

Dutch D, Bell L, Hunter SC, Denney-Wilson E, Golley RK (2024) Caregiver acceptability and feasibility of child health behaviour screening in Primary Health Care: A multi-method pilot study at Health2Go *(in preparation for Health Expectations)*

1.6.2 Thesis presentations

Study 1 (Chapter 4)

Dutch D, Bell L, Zarnowiecki D, Johnson BJ, Denney-Wilson E, Byrne R, Cheng H, Rossiter C, Manson A, Davidson K, Golley RK. 123: Screening Tools for Health Behaviours in Primary Healthcare Settings: A Systematic Review. *10th International Conference on Nutrition & Growth*, London UK, 2023 (e-Poster presentation).

Dutch D, Bell L, Zarnowiecki D, Johnson BJ, Denney-Wilson E, Byrne R, Cheng H, Rossiter C, Manson A, Davidson K, Golley RK. 509: Screening tools for children's health behaviours in primary

healthcare settings: A Systematic review. *ISBNPA 2023 Annual Meeting*, Uppsala, Sweden, 2023 (Poster presentation).

Dutch D, Screening tools for Health Behaviours in Primary Health Care Settings: A Systematic Review, *EPOCH-Translate Annual Meeting 2023*, Deakin University, Melbourne, Australia 2023 (Oral presentation)

Dutch D, Screening tools for Health Behaviours in Primary Health Care Settings: A Systematic Review, 27th June 2023, as part of Flinders University Caring Futures Institute (CFI) Seminar Series, Face-to-Face & Virtual. Recording available to CFI members.

Dutch D, Primary Health Care Systematic Review Update, *EPOCH-Translate Presentation*, Deakin University, Melbourne, Australia 2022 (Oral presentation)

Study 2 (Chapter 5)

Dutch D, What do guidelines say about child health behaviour screening in primary healthcare? *South Australian Healthy Lifestyle Research Forum 2023,* University of South Australia, South Australia 2023 (Oral Presentation)

Dutch D, What do guidelines say about child health behaviour screening in primary healthcare? *Child Health Research Symposium*, Perth Children's Hospital, Western Australia 2023 (Oral presentation)

Study 3 (Chapter 6)

Dutch D, Bell L, Hunter SC, Denney-Wilson E, Golley RK. Child health behaviour screening in primary health care: exploring opportunities with practitioners. *Preventive Health Conference 2024,* Darwin Convention Centre, Northern Territory (Oral presentation)

Overall Thesis

Dutch D, Hunter SC, Bell L, Denney-Wilson E, Golley RK. Embedding children's health behaviour screening within routine primary health care as a strategy to support growth, health, and development in the early years. *ISBNPA 2025 Annual Meeting,* Auckland, New Zealand, 2025 (Oral presentation)

1.6.3 Other presentations

‘The importance of screening for health behaviours in the early years – A new role for Oral Health Professionals’, 20th October 2022, Australian Dental and Oral Health Therapist’ Association (ADOHTA), Online/Virtual. Recording available to ADOHTA members.

2 INTRODUCTION AND LITERATURE REVIEW

2.1 Chapter Overview

The early years (birth to five years) is a critical time to lay the foundations for positive health behaviours, however, many children do not meet national dietary and movement guidelines. Primary Health Care (PHC) plays an important role in monitoring and supporting children's growth, health, and development through early intervention and health promotion activities. Current recommended practice within PHC relies on monitoring growth to inform health promotion advice and support. Growth monitoring has many limitations impacting its effectiveness and acceptability, including caregiver receptiveness, stigma, and impact on rapport, highlighting an opportunity to consider an alternative approach. Screening for children's health behaviours poses a novel opportunity to understand a child's dietary and movement behaviours and support the provision of tailored advice and support as an early intervention and health promotion strategy in PHC.

Section 2.2 describes the importance of the early years in establishing positive child health behaviours, and the influential role of caregivers in supporting children's growth, health, and development. The Australian PHC policy and practice context is then introduced in Section 2.3. Section 2.4 provides an overview of the limitations and challenges of current practice in PHC while Section 2.5 poses an opportunity to consider a novel approach to monitoring and promoting children's health behaviours in PHC. In summary, this chapter provides the context and rationale to support the exploration of health behaviour screening in Australian PHC as a strategy to support children's growth, health, and development in the early years. This chapter highlights key research gaps to inform the thesis aim and objectives.

2.2 Children's growth, health, and development

The first five years of life is a critical stage for children's growth, development, and establishment of health behaviours. Dietary intake, physical activity, sedentary behaviour, and sleep are key modifiable health behaviour domains which influence lifelong health. Section 2.2 highlights the importance of the early years for establishing positive health behaviours, provides context to the current state of Australian children's health behaviours, and highlights the influential role of caregivers in supporting children's growth, health, and development.

2.2.1 The importance of the early years (birth to five years)

The first five years of life is a critical stage of development and rapid growth, characterised by regular and predictable developmental milestones, and the formation of behaviours that lay the foundation for lifelong health and wellbeing [24, 25]. The early years is a vital time for establishing positive health behaviours including dietary intake, physical activity, sedentary behaviour, and sleep to support optimal growth, health, and development.

Key aspects of children's dietary intake during the early years includes milk feeding such as breastmilk and formula feeding, food and beverage intake, as well as the consideration of diet quality and meal patterns [2, 3]. The early years is a time of transition from a milk-based diet (breastmilk or infant formula) to other sources of nutrition, when breastmilk alone is no longer sufficient to meet energy and nutritional requirements for optimal growth [26, 27]. This makes the early years a vulnerable time for risk of energy and nutritional deficiencies that may lead to poor child health outcomes including impaired growth or development [28, 29]. The introduction of appropriate and nutritious solid foods at around 6 months of age is another important dietary behaviour during the early years [3]. Supporting children to consume foods in line with dietary guidelines, i.e. high in nutrient-dense core foods such as fruits, vegetables, lean protein, dairy, and wholegrains and low in energy-dense discretionary foods is crucial for supporting their growth, health, and development [30].

Children's movement behaviours also play an important role in their growth, health, and development, including the amount and type of physical activity, amount and frequency of tummy time, amount of sedentary and screen time, and sleep duration [2]. Daily routines including regular physical activity, limited sedentary and screen time, and adequate quality and quantity of sleep, are beneficial to supporting children's growth, health, and development [18, 31].

Establishing positive health behaviours in the early years is not only vital for supporting early childhood growth, health, and development, it is also critical for supporting lifelong health. This is

because health behaviours established in childhood can track into adolescence and adulthood [32-34]. According to the most recent Australian population data, chronic disease is the leading cause of illness, disability, and death in Australian adults with nearly one in two (46.6%) having a chronic disease and almost one in five (18.6%) of Australian adults having two or more chronic conditions [35]. Over one third (38%) of total chronic disease burden is potentially avoidable due to modifiable health behaviours such as poor diet quality and inadequate physical activity, contributing to significant health and economic burden [36, 37]. This further highlights the importance of establishing positive health behaviours during the early years to support lifelong health and reduce chronic disease risk in adulthood [38-40].

Health behaviours including dietary intake, physical activity, sedentary behaviour, and sleep are often interrelated and co-exist, having an influence on each other [24, 25, 41-45]. Higher diet quality has been associated with reduced screen time [46, 47], whilst shorter sleep duration has been associated with lower diet quality and physical activity levels [48, 49]. National data from the Netherlands has also shown that child health behaviours exist in clusters, with health behaviours aligned with national guidelines occurring together [50]. Adherence to dietary and movement guidelines is also known to decline during childhood, including reduced diet quality and physical activity, and increased sedentary behaviour [51-54]. Effective health promotion during the early years should therefore recognise the importance of all four health behaviours domains (diet, physical activity, sedentary behaviour, and sleep) on growth, health, and development [55, 56]. Identifying health behaviours as they exist collectively, rather than in isolation, recognises their influence on each other. Key growth and developmental milestones provide further context to children's health behaviours, reinforcing the importance of providing support across the early years, rather than at just one time point. Therefore, the early years provides an important opportunity to support the development of positive health behaviours for optimal childhood growth, health, and development, but also to play a critical role in reducing chronic disease risk and supporting optimal health across the life-course.

2.2.2 State of Australian children's health behaviours in the early years

To support optimal growth, health, and development in children, we must first understand the recommendations within national evidence-based guidelines and how children are currently faring. The Australian National Health and Medical Research Council (NHMRC) Infant Feeding Guidelines [57], Australian Dietary Guidelines [30] and 24hr Movement Guidelines [31] provide the most current evidence-based recommendations for health behaviours to support optimal growth, health, and development of Australian children.

The NHMRC Infant Feeding Guidelines recommend exclusive breastfeeding for the first six months of life to support optimal infant growth, health, and development [57]. The guidelines then recommend the introduction of complementary nutritious and iron-rich foods from around 6 months of age, with continued breastfeeding to 12 months and beyond [57]. The Australian Dietary Guidelines provide age-appropriate recommendations for the daily consumption of the five food groups, highlighting the importance of diet variety [30]. The diets of young Australian children are not consistent with national dietary guidelines with only 28% of Australian children aged 2-3 years meeting recommendations for fruit and vegetable intake [58, 59]. There is limited national data available on the dietary intake of Australian children under 2 years of age. The OzFITS 2021 cross-sectional survey provides the most contemporary nationwide data on Australian children aged <24 months and describes a high prevalence of iron and zinc inadequacy in infants, and excessive sodium intake in toddlers included in the survey sample (n = 976 children) [27].

The Australian 24hr Movement Guidelines provide age-appropriate recommendations for daily activity, sedentary behaviours, screen-time and sleep to support optimal growth, health, and development of young children [31]. Australian children's movement behaviours are also not consistent with national movement guidelines. According to the most recent nationally representative survey, only 17% of children aged 2 - 5 years met both physical activity and sedentary behaviour recommendations [54]. This is consistent with findings from a cross-sectional survey of 477 Australian caregivers of children aged 0 - 4 years which indicated low adherence to national diet and movement guidelines [60]. The proportion of children meeting the movement guidelines also declines with age, including physical activity (83% of 2yo reducing to 10% 5yo) and sedentary screen-based time (44% 2yo reducing to 20% 5yo) [54]. Overall, current adherence of young children to the Australian Dietary Guidelines and 24hr Movement Guidelines is poor. This indicates room for improvement and a need to better support children and families to ensure children have the best start in life to support their growth, health, and development.

2.2.3 Caregiver's role in supporting children's growth, health, and development

Caregivers of young children play a pivotal role in the formation of positive health behaviours in the early years [61, 62]. That is, children do not exist in isolation, rather they exist as part of a family unit, and are dependent on their caregivers for many aspects of their life. For this thesis, caregivers refer to and includes biological parents, step-parents, grandparents, and extended family who also have a profound influence on a child's growth, health, and development. Caregivers have an influential role in the development of children's health behaviours through parenting practices [63], role modelling, and co-participation [64-66], and influencing the home environment to support

positive dietary and movement behaviours [2, 3]. Parenting practices refers to the rules and routines set by caregivers regarding mealtimes, physical activity, sleep, and sedentary behaviour [2, 3]. Positive parenting practices that support healthy relationships between children and caregivers are critical for early childhood development and have been associated with positive child health behaviours including higher fruit and vegetable consumption [67].

Caregivers are also responsible for food provision within the home. The Division of Responsibility in Feeding articulates caregivers being responsible for *what, when* and *where* a child eats, and the child being responsible for *how much, how fast* and *how frequently* [68]. Developed by Ellyn Satter, a registered dietitian and psychotherapist, the Division of Responsibility in Feeding recognises the importance and interrelatedness of responsive feeding, child development, the family mealtime environment, and nutrition [68]. Supporting caregivers to establish positive parenting practices and home environments aligned with the Division of Responsibility in Feeding, allows children to listen to their hunger and fullness cues, avoids pressuring to eat, and encourages child autonomy [68]. Caregiver self-efficacy, knowledge, and beliefs further influence the development of child health behaviours including knowing how to offer solid foods and knowing what foods should be offered or avoided [3]. Literature demonstrates that increased caregiver knowledge of dietary and movement guidelines is also associated to greater compliance with recommendations [66, 67].

Caregivers are willing to support and promote positive child health behaviours to support child growth, health, and development [69]. A systematic review investigated strategies to promote child health behaviours and demonstrated that caregivers are receptive to, and capable of, influencing the development of positive health behaviours in their young children [39]. Literature also demonstrates caregiver acceptability and receptiveness to health promotion interventions in early childhood; however, they need to be practical, realistic, evidence-based, timely, accessible, non-judgemental, and from trusted sources [70, 71]. Increasing caregivers' knowledge, confidence, and self-efficacy to establish and promote positive child health behaviours is essential to support children's growth, health, and development [69].

2.3 Primary Health Care, a vital setting for supporting children's growth, health, and development

Understanding the settings and services that caregivers and young children utilise is essential to inform and implement efforts to improve child growth, health, and development in the early years. The Early Years System is defined as the *"universal and targeted government and non-government policies, programs, services, and supports available to children from birth to five years, and their families"* [1, 4, 5]. Health care settings are widely recognised and accessed services within the Early Years System and therefore have a large influence on supporting children's growth, health, and development. As the frontline of the Australian health care system, Primary Health Care (PHC) is often the first point of contact for families with young children [72]. PHC is widely accessible due to its many locations, affordable due to Medicare subsidies, and provides access to a wide range of services delivered by a multidisciplinary team including general practitioners, nurses, and allied health practitioners [73-76]. PHC has many key roles and responsibilities including health promotion in addition to the treatment and management of acute and chronic conditions [72]. Early intervention and health promotion are key recognised roles of PHC including screening for disease risk factors, providing counselling, and supporting referral pathways to community, tertiary, and specialist services [72]. PHC therefore enables a universal and holistic approach to supporting early intervention and health promotion [74].

Section 2.3 highlights the role and context of PHC as a trusted and valued setting for promoting and supporting children's growth, health, and development. Challenges and limitations to current practice are highlighted, and an alternative approach to monitoring and promoting child health behaviours in PHC is discussed.

2.3.1 Primary Health Care policy

Understanding the national PHC policy context is critical for supporting the success of interventions. The provision of preventive care requires supportive health policy to shape practice [77, 78]. Health policy is defined as *"courses of action (and inaction) that affect the set of institutions, organizations, services, and funding arrangements of the health system (both public and private)"* [8]. Key national policy documents that aim to shape preventive care in the Australian PHC setting are summarised in Table 1.

Key themes of national health policy include improving the quality and access of PHC and supporting an integrated and strengths-based approach to preventive care in the early years (Table 1). This includes prioritising preventive health care by breaking down silos across services and sectors and enabling a strengths-based child and family-centred approach. Evidence and

policy suggest a need for a paradigm shift in PHC [75]. To improve the long-term sustainability and effectiveness of the health care system, there needs to be a shift from prioritising treatment and management of illness and disease, towards a wellbeing system that prioritises early intervention and health promotion [75]. Enabling a coordinated and multidisciplinary approach with a focus on *"what matters to patients"* is crucial to ensuring a holistic and integrated approach to health [75]. To achieve this, PHC practitioners must understand their patient's unique health behaviours and context. Previous reviews of early childhood PHC policies have identified a paucity of guidance and opportunities to strengthen policies to enable practitioners to conduct early intervention and health promotion in PHC [79-83]. Screening and early intervention provides an opportunity to support tailored support and health promotion in PHC. Therefore, PHC policies that encourage screening and health promotion in early childhood are likely to support children to have the best start to life and maintain health across the life course.

Table 1: Summary of the Australian National Health Policy Context

Name of Document *(Year)*	**Author**	**Aims/Goals/Objectives/Priorities**
Early Years Strategy 2024-2034 (2024) [5]	Department of Social Services, Commonwealth of Australia	**Vision:** That all children in Australia thrive in their early years. They have the opportunity to reach their full potential when nurtured by empowered and connected families who are supported by strong families. **Principles:** 1. Child- and family-centred 2. Strengths-based 3. Respect for families and communities 4. Equitable, inclusive and respectful of diversity 5. Evidence-informed **Priority focus areas:** 1. Value the early years 2. Empower parents, caregivers and families 3. Support and work with communities 4. Strengthen accountability and coordination
Future focused primary health care: Australia's Primary Health Care 10 Year Plan 2022-2032 *(2022) [75]*	Department of Health, Commonwealth of Australia	**Aims:** 1. Improve people's experience of care 2. Improve the health of populations 3. Improve the cost-efficiency of the health system 4. Improve the work life of health care providers
National Obesity Strategy 2022-2032 *(2022) [84]*	Health Ministers Meeting,	**Vision:** For an Australia that encourages and enables healthy weight and healthy living for all **Ambitions:**

	Commonwealth of Australia	1. All Australians live, learn, work, play and age in supportive, sustainable, and healthy environments 2. All Australians are empowered and skilled to stay as healthy as they can be 3. All Australians have access to early intervention and supportive health care **Guiding principles for implementation:** 1. Creating equity 2. Tackling weight stigma and discrimination 3. Addressing wider determinants of health and sustainability 4. Empowering personal responsibility to enable healthy living
ACSQHC National Safety and Quality Primary and Community Healthcare Standards *(2021) [85]*	Australian Commission on Safety and Quality in Health Care	**Aim:** Protect the public from harm and improve the quality of health care delivered by describing a nationally consistent framework, which all primary and community healthcare services can apply when delivering health care
National Preventive Health Strategy 2021-2030 *(2021) [21]*	Department of Health, Commonwealth of Australia	**Vision:** To improve the health and wellbeing of all Australians at all stages of life through prevention **Aims:** 1. All Australians have the best start to life - children grow up in communities that nurture their healthy development 2. All Australians live in good health and wellbeing for as long as possible 3. Health equity is achieved for priority populations 4. Investment in prevention is increased - ensure prevention is valued and funding is rebalanced towards prevention

2020-2025 National Health Reform Agreement *(2020) [86]*	Department of Health and Aged Care, Commonwealth of Australia	**Strategic Priorities:** 1. Improving efficiency and ensuring financial sustainability 2. Delivering safe, high-quality care in the right place at the right time 3. Prioritising prevention and helping people manage their health across their lifetime, including long-term reforms in prevention and wellbeing 4. Driving best-practice and performance using data and research
Australia's Long Term National Health Plan (to build the world's best health system) *(2019) [87]*	Department of Health, Commonwealth of Australia	**Goal:** Make Australia's health system the world's number one **Pillars**: 1. Guaranteeing Medicare, stronger primary care and improving access to medicines through the PBS 2. Supporting our public and private hospitals, including improvements to private health insurance 3. Mental health and preventive health 4. Medical research to save lives and boost our economy
National Action Plan for the Health of Children and Young People 2020-2030 *(2019) [88]*	Department of Health, Commonwealth of Australia	**Aim:** Drive improvement in the health of all children and young people in Australia across the life course, noting challenges of disparity and inequity in health outcomes between individuals, areas, and different sections of the population. **Priority areas:** 1. Improving health equity across populations 2. Empowering patients and caregivers to maximise healthy development 3. Tackling mental health and risky behaviours 4. Addressing chronic conditions and preventive health 5. Strengthening the workforce

National Framework for Health Services for Aboriginal and Torres Strait Islander Children and Families (2016) [89]	Department of Health, Commonwealth of Australia	**Vision:** Aboriginal and Torres Strait Islander children and their families access high quality, evidence-based, and culturally safe child and family health services to support their optimal health, development, and wellbeing. **Principles:** 1. Access 2. Equity and Equality 3. Leadership and Partnership 4. Collaboration 5. Evidence-based 6. Strengths-based 7. Culturally safe and competent services 8. Workforce development 9. Accountability
National Primary Health Care Strategic Framework *(2013) [90]*	Standing Council on Health, Commonwealth of Australia	**Vision:** A strong, responsive, and sustainable primary health care system that improves health care for all Australians, especially those who currently experience inequitable health outcomes, by keeping people healthy, preventing illness, reducing the need for hospital services, and improving management of chronic conditions. **Strategic Outcomes:** 1. Build a consumer-focused integrated primary health care system 2. Improve access and reduce inequity 3. Increase the focus on health promotion and prevention, screening, and early intervention 4. Improve quality, safety, performance, and accountability

2.3.2 Primary Health Care, a trusted and valued setting for caregivers of young children

PHC services in Australia are delivered through a range of public and private mechanisms. In Australia, General Practice and Child and Family Health Services are the two key avenues for PHC in early childhood and play an important role in the provision of preventive care. Each Australian jurisdiction is responsible for the provision of universal child and family health services, hence, the way in which these services are funded and delivered varies across Australia. Each jurisdiction has a schedule of universal contacts from birth to school age which are delivered through a variety of models and settings. This includes routine health checks, immunisation appointments, and multidisciplinary allied health and children and family health services. Families may access child health services from any or all of these providers at different developmental stages, and as their needs change.

General Practice and Child and Family Health Services are valued, trusted, and frequently accessed settings for caregivers of young children due to regular encounters. Regular contact with PHC allows practitioners and caregivers of young children to foster trusting relationships over time [91]. This further encourages families to have ongoing engagement with the health care system and therefore support better health outcomes. A national survey of over 700 Australian caregivers with children aged under five, indicated 84% visited a child and family health nurse and 72% visited a general practitioner for routine child health checks [92]. Children visit a general practitioner on average seven times during their first year of life, and children from non-English speaking backgrounds were more likely to have a greater number of general practitioner visits compared with their English-speaking and indigenous background counterparts [93, 94]. PHC practitioners recognise their role and the importance of providing early intervention and preventive care in the early years [95, 96]. PHC practitioners are in an important position to provide evidence-based information, tailored advice, and facilitate ongoing support and referral pathways. PHC is therefore essential to achieving a multidisciplinary, holistic, and universal approach to health and is an ideal and opportunistic setting for early intervention and health promotion to support children’s growth, health, and development.

2.3.3 Current practice in Primary Health Care

Monitoring and providing advice to support children's health behaviours is a crucial component to PHC in the early years. The Royal Australian College of General Practice recommends the *5As (ask, assess, advise, assist/agree, and arrange) Framework* for monitoring and promoting child health, and current recommended practice is based on growth monitoring [97][95, 98, 99]. Growth monitoring is the regular measurement, plotting, and interpretation of height, length, weight, head circumference and BMI measurements on age- and sex-specific growth percentile charts [100]. The Centers for Disease Control and Prevention (CDC) recommends that health providers use the World Health Organisation (WHO) growth standards to monitor growth for children aged birth to two years [101] and CDC growth charts for children aged two years and older [102].

2.3.4 Challenges and limitations to current practice

There are many challenges and limitations to current practice in PHC including managing competing priorities in PHC, the complexities and limitations of growth monitoring, and practitioner and caregiver reluctance to engage in weight-focussed conversations. Challenges to prioritising and providing preventive health care in PHC is often due a demand for the treatment and management of illness and disease [103, 104]. Barriers to providing health behaviour advice in PHC include time pressures, lack of confidence in motivational interviewing skills, and fear of damaging the patient-practitioner therapeutic relationship if patients are resistant to counselling and behaviour change [105, 106]. According to a 2019 national survey of general practitioners, 80% of respondents view nutrition and physical activity counselling as a core aspect of their role, however advice provided is general and not individualised [105]. Supporting practitioners to prioritise and deliver preventive care during both routine and opportunistic child health visits is crucial to supporting children's growth, health, and development [106, 107].

There are numerous limitations to growth monitoring impacting its effectiveness as a screening approach. International systematic reviews have found a lack of high-level evidence to support the effectiveness of routine growth monitoring as a screening tool in practice, and it's benefit on child health [108-110]. Growth charts were also not intended to be a diagnostic tool, rather to contribute to the overall clinical impression of a child's growth trajectory [108, 109, 111-113]. Originally, growth charts were intended to be used to identify signs of undernutrition or faltering growth in young children. However, in developed countries, growth charts are now more typically used to screen for and identify overweight and obesity, and as a proxy measure of overall health, and are therefore typically used in the wrong context. The first five years of life is also a time of substantial and variable growth,

unique to each child, resulting in potential fluctuations across growth percentiles. As growth monitoring does not translate to actionable behaviour change strategies, providing health promotion advice based on a growth measurement at one point in time could be harmful. Growth percentile charts also do not consider ethnic or genetic characteristics that influence and provide context to a child's unique health behaviours [114].

Challenges and limitations of growth monitoring also have an impact on its acceptability to both practitioners and caregivers. As a complex task, practitioners often inaccurately and inconsistently complete height and weight measurements. As few as 10% of General Practitioners reporting always plotting growth measurements on BMI-for-age charts [115], with an international survey highlighting practitioners having difficulty plotting and interpreting growth charts to inform practice, resulting in potentially incorrectly informed advice [116]. A scoping review by Rossiter and colleagues investigated PHC professionals' practice in monitoring infant growth and highlighted a lack of comprehensive measurement and limited practitioner confidence communicating growth concerns to parents and responding to growth and development queries [117]. Lack of practitioner confidence about referral pathways and treatment success are further obstacles [115, 118].

Literature investigating caregiver perceptions and experiences of growth monitoring have demonstrated difficulty interpreting and understanding results from growth charts [111, 114, 119]. This is related to factors such as growth monitoring not always being explained to caregivers, health practitioners not consistently or accurately using charts, misconceptions regarding 'ideal' or 'normal' growth, and limited understanding of BMI and 'healthy weight' [120]. Interpreting growth charts may also be increasingly difficult to interpret for caregivers with lower health literacy [111]. Inaccurate, incorrect, and inconsistent completion of growth charts could result in practitioners providing inappropriate advice or leaving caregivers to implement ill-informed strategies without appropriate support, including potentially harmful parenting practices. Literature has shown caregivers to describe weighing the child during a PHC appointment feeling like a "tick the box" activity and that practitioners need to take a more holistic approach to gathering information on the family before providing recommendations [120]. Caregivers also recognised that height and weight measurements alone are unable to demonstrate the health of their child and the need to consider the sensitive nature of the topic and to take a strengths-based approach to supporting the child's health behaviours [111, 120].

PHC practitioners are also reluctant to have weight-focused conversations with caregivers due to concerns about caregiver receptiveness, stigma, and impact on rapport [98, 115, 118, 120-122]. Conversely, evidence shows caregivers are also not receptive to engaging in

weight-focused conversations with PHC practitioners [123, 124]. Routine growth monitoring and weight-focussed conversations can result in caregiver anxiety, distress, guilt, shame, and blame [112, 114, 120]. This can potentially have a harmful impact on parenting practices, impact rapport, and make caregivers reluctant to engage with health providers in the future. Caregivers indicated accessing information about child health behaviours but still reported concerns and interest for further information and support [60, 106]. Therefore, there is an opportunity to improve preventive health care delivered in PHC and a need to consider an alternative approach to monitoring and promoting children's health behaviours in PHC.

2.3.5 An opportunity to screen for child health behaviours

Screening for children's modifiable health behaviours including dietary intake, physical activity, sedentary behaviour, and sleep provides an alternate approach to growth monitoring in Primary Health Care (PHC). Health behaviour screening allows PHC practitioners to implement the 5A's Framework to understand a child's unique health behaviours (Ask/Assess) to inform individualised patient-centred counselling (Advise), and intervention (Assist/Arrange) to support long-lasting positive behaviour change [41]. Most importantly, it is key to monitor and promote children's health behaviours (dietary intake, physical activity, sedentary behaviour, and sleep) regardless of their growth. Child health behaviour screening therefore highlights an opportunity to overcome the limitations of growth monitoring and encourage early intervention and health promotion in PHC aligned with 5A's Framework.

Valid and reliable screening tools for measuring children's health behaviours in PHC settings are needed to support the early intervention and tailored health promotion. A systematic review by Byrne and colleagues identified and described 12 brief screening tools to measure obesity-related behaviours in children in the first five years of life and reported their psychometric properties [125]. However, this review did not specifically describe tools used and tested in PHC settings and were unable to identify a screening tool that measured all four health behaviour domains. A recent systematic review by Krijger and colleagues identified and described 41 unique screening tools to measure health behaviours in children aged 0-18 years in community settings [126]. Eligibility criteria for this review did not include a limit for number of items within screening tools, resulting in long tools being captured, including one screening tool with 116 items. Long tools are not practical for already time poor PHC practitioners. This review also predominately focused on psychometric properties of screening tools and actions following screening.

Despite these two comprehensive systematic reviews on health behaviour screening in children, neither described parent or practitioner acceptability, feasibility, or efficacy in the PHC setting. There is also a lack of knowledge regarding the implementation strategies and tools/resources required to embed screening into routine PHC practice.

2.3.6 Possible benefits of child health behaviour screening

Possible benefits of introducing health behaviour screening includes taking the emphasis off weight-related outcomes and shifting the focus to modifiable health behaviours that directly influence growth, health, and development. Health behaviour focussed conversations may also be more approachable and acceptable from a caregivers' perspective [106]. Shifting practice to measuring health behaviours may support practitioners to provide more

individualised and tailored counselling, support increased adherence to diet and movement behaviour guidelines, facilitate tracking of health behaviours over the life course and reduce chronic disease risk in adulthood. Health behaviour screening may also provide an opportunity for caregivers to reflect on their child's current health behaviours and consider any concerns they might have or indicate opportunities for further support.

Embedding child health behaviour screening within existing health care delivery systems is a cost-effective and sustainable support approach. Delivery of health behaviour screening and support approaches through PHC provides a universal approach that can reach across all sectors of the community, including the most vulnerable families. This novel approach would mean all children have regular health behaviour screening, rather than just children who are deemed at risk. Child health behaviour screening encourages a strengths-based philosophy to empower and encourage health promoting behaviours for children and their families.

There is a need to develop, test, and evaluate a brief standardised and efficient screening tool that captures collective child health behaviours that is suitable in a time poor setting such as PHC. Health behaviour screening in the early years could alter a child's health and development trajectory, however the feasibility, acceptability, and efficacy of this approach in an Australian PHC context is not known [127].

2.4 Summary of research gaps

This chapter has provided an introduction and review of the current literature related to supporting children's growth, health, and development in the early years. A summary of the current context and gaps in the research are highlighted below.

2.4.1 Summary of current context

The first five years of life is a critical stage of growth, development, and lays the foundation for lifelong health and wellbeing. During this time, children's health behaviours are established including their dietary intake, physical activity, sedentary behaviours, and sleep habits. These key health behaviours can track into adolescence and adulthood and therefore influence health across the life course.

Primary Health Care (PHC) is a widely accessed, trusted, and valued setting that provides supports to caregivers and young children to support child optimal growth, health, and development. Current recommended practice in PHC is based predominantly on growth monitoring in children via height and weight measurements which has many limitations impacting its effectiveness and acceptability as a screening approach. National health policies also highlight the importance of shifting the focus from weight-based approaches in children to targeting modifiable health behaviours.

Child health behaviour screening provides an alternate approach to growth monitoring and addresses known barriers and limitations of weight-focused approaches. Brief screening tools that measure health behaviours exist, and have been investigated internationally, demonstrating feasibility and caregiver and practitioner acceptability. However, the suitability, feasibility, and acceptability of child health behaviour screening within Australian PHC is unknown.

2.4.2 Recommendations for monitoring and promoting child health behaviours within Australian PHC Guidelines

Many national, state/territory, and local practice guidelines exist to inform and guide practice in PHC. Growth monitoring and brief health promotion advice are well known responsibilities for PHC practitioners; however, it is not currently known if these documents provide recommendations for conducting child health behaviour screening in practice.

2.4.3 Perspectives of child health behaviour screening in Australian PHC

Understanding practitioners' and caregivers' perspectives and acceptability of shifting PHC practice towards health behaviour screening is critical for successful implementation and

long-term sustainability. Caregiver and practitioner perspectives of child health behaviour screening have been described internationally, however there is a limited understanding of perspectives in an Australian context.

2.4.4 Feasibility and acceptability of child health behaviour screening in Australian PHC

International literature demonstrates the promise of child health behaviour screening as an acceptable and alternative approach to growth monitoring. However, the feasibility and acceptability of child health behaviour screening within Australian PHC is unknown.

2.5 Addressing the research gaps

To address the gaps identified in the existing literature, the following thesis aim and objectives were identified.

2.5.1 Thesis Aim

This thesis aims to determine the feasibility and acceptability of embedding child health behaviour screening within routine Primary Health Care (PHC) as a strategy to support growth, health, and development in the early years (birth to five years).

2.5.2 Thesis Objectives

To address the thesis aim, five thesis objectives were identified:

1. Understand current Australian practice guidelines for PHC that provide recommendations for the monitoring and promotion of child health behaviours in the early years.
2. Identify and describe the effectiveness, acceptability, and feasibility of child health behaviour screening tools used in PHC settings.
3. Identify and prioritise PHC practitioner generated tool features and supports to implement and embed child health behaviour screening in PHC.
4. Understand caregiver perspectives, experiences, and acceptability of child health behaviour screening within PHC.
5. Develop and test a proof-of-concept child health behaviour screening tool for use in PHC.

2.6 Chapter Summary

This chapter provided a summary of the relevant background literature highlighting the importance of supporting children's health behaviours including their dietary intake, physical activity, sedentary behaviour, and sleep habit in the early years (birth to five years). The role and importance of Primary Health Care (PHC) in monitoring and supporting child health behaviours was described, highlighting an opportunity to screen for child health behaviours within routine PHC. A summary of research gaps was presented in Section 2.6 providing rationale for the thesis aim and objectives described in Section 2.7. The following chapter describes the methodological and theoretical frameworks utilised to achieve the thesis aim and objectives.

3 METHODOLOGICAL APPROACH AND THEORETICAL PERSPECTIVE

3.1 Chapter Overview

This chapter provides an overview of the methodological approach and theoretical frameworks utilised within this thesis.

Thesis Aim: To determine the feasibility and acceptability of embedding child health behaviour screening within routine Primary Health Care (PHC) as a strategy to support growth, health, and development in the early years (birth to five years).

Thesis Objectives:

1 Understand current Australian practice guidelines for PHC that provide recommendations for the monitoring and promotion of child health behaviours in the early years.
2 Identify and describe the effectiveness, acceptability and feasibility of child health behaviour screening tools used in PHC settings.
3 Identify and prioritise PHC practitioner generated tool features and supports to implement and embed child health behaviour screening in PHC.
4 Understand caregiver perspectives, experiences, and acceptability of child health behaviour screening within PHC.
5 Develop and test a proof-of-concept child health behaviour screening tool for use in PHC.

3.2 Researcher Positionality

Researcher positionality refers to a researcher's perspective that has a significant influence on how a researcher approaches, conducts or interprets research [128]. Key components of positionality include how the researcher views the world and knowledge (epistemology), and the researcher's own identity, experience, and context, and how these influence the research being conducted (reflexivity) [128].

3.2.1 Epistemology

Epistemology is the branch of philosophy related to the theory of knowledge including the nature, origin, and limits of human knowledge [129]. The epistemological perspective of research describes how a researcher views and believes knowledge, truth, and reality [129]. The epistemological framework to address the aim and objectives of this thesis was pragmatism.

Pragmatism views knowledge as both real and constructed and can be both subjective and objective in nature [130]. Pragmatism is a flexible and reflexive approach to research design, embracing both quantitative and qualitative methods and allowing the research to move between inductive and deductive approaches to answer the research question, create new knowledge, and develop theories [130]. Pragmatism supports that there are many ways of conducting research and that a combination of different research methods will support a more comprehensive understanding of the phenomena being investigated [130].

Particularly relevant to this PhD, pragmatism also views knowledge as being constructed based on real-world experiences and considers the perspectives of key partners and context to interpret findings [131]. Further, pragmatism recognises the researcher's positionality and the influence on how the research is conducted and interpreted [131]. Therefore, the worldview of pragmatism is appropriate for this research and provides the epistemological justification to inform the multi-method approach utilised in this thesis.

3.2.2 Researcher reflexivity

I am a 28-year-old white Australian female, born and living on the unceded lands of Kaurna Yerta. I completed a Bachelor of Nutrition and Dietetics (Honours) in 2018 from Flinders University and worked clinically as an Accredited Practising Dietitian for three years prior to commencing my PhD. During my experience as a clinical dietitian, I was able to support patients and their families to improve their health through evidence-based nutrition care. A substantial component of my role included advocating to the broader multidisciplinary team regarding patient's nutrition goals and the importance of nutrition regardless of a patient's

weight status. This experience reinforced my values and commitment as a clinician and researcher to provide and align to inclusive, non-stigmatising and strengths-based health care. I recognise that my positionality is shaped by my privilege, access to resources, and experience as a health care provider and consumer in Australia. I strive to be aware of my own biases and how these influence my research.

3.3 An integrated and informed approach

Given the epistemology of pragmatism and researcher values identified in Section 3.2, this thesis takes an overarching integrated knowledge translation approach to guide the methodology. Integrated knowledge translation recognises the importance of taking an integrated and informed approach to bridge the gap between research and practice and address the challenges to implementing a change in routine practice.

3.3.1 Challenges to implementing a change in routine practice

The aim of health research is to improve the health care system to provide more effective, affordable, efficient, and evidence-based health care. Unfortunately, this is not achievable unless health services and practitioners utilise and adopt research findings into their practice [9]. It is commonly cited that is takes 17-20 years for the adoption of interventions into routine practice [132]. This highlights that implementing a change in practice requires more than just education and dissemination, but a proactive and substantive collaboration between researchers and practitioners [133].

Challenges to implementing a change in routine practice include lack of funding, resources, time, and the need for administrative and managerial support [134]. Practitioners require adequate training and support to learn a new practice and feel confident to implement the practice in their routine care. Research investigating barriers to adopting practice guidelines identified that clinicians may not have the skills or expertise to implement new recommendations, or the service may not have adequate equipment, resourcing, or staffing to deliver the new practice [133]. As this thesis focuses on the Primary Health Care (PHC) context, another challenge to consider is the competing demand against existing PHC responsibilities including the treatment and management of disease and injury [103, 104].

3.3.2 Bridging the gap between research and practice

Integrated knowledge translation aims to bridge the gap between research and practice and support a more effective uptake of evidence-based practices [12]. Integrated knowledge translation is an approach that aims to enhance the relevance and usefulness of research by involving key partners and knowledge users throughout the research process [14, 15].

Research that uses an integrated approach is therefore more likely to address evidence-practice gaps and ultimately contribute to better health outcomes, more effective health services, and a strengthened health care system [13].

Key partners or knowledge users can include policy makers, professionals, consumers, researchers, and industry; all of whom should be involved throughout the research process in an effort to increase the relevance, applicability, efficiency and impact of research [14]. This may include engaging with key partners to determine acceptability, feasibility, and sustainability of implementing this change in practice and developing a contextual understanding of where research findings will be implemented [12, 14]. It is therefore critical to identify and understand the relevant partners to inform research study design and application.

3.3.3 Mapping of Primary Health Care (PHC) partners

A key component of integrated knowledge translation is recognising and understanding the people, groups, and organisations that have potential interest in, influence upon, or are likely to be impacted by the outcomes of the research [135]. Contemporary research highlights the importance of language, decolonising research norms and critically examines the ethical considerations and limitations of the term “stakeholder” [136]. This thesis will therefore use ‘partners’ as an inclusive and meaningful term when referring to any individual, group, or organisation that may be affected by, or have an effect on the research [137]. Key partners can include researchers who design, develop, and test innovations, policy makers who design and pay for services, administrators who shape program direction, providers and supervisors, patients and their family members, and interested community members and advocates [137, 138].

Mapping of key PHC partners allows for the identification of who will be most affected and interested by an intervention in the PHC setting, and who will have the most positive or negative influence to inform engagement throughout the entire research process [137]. Engaging with relevant partners can provide insightful and varied perspectives on real-world barriers and facilitators to intervention and implementation success and can also generate interest and support for an effort [137, 139-141].

Figure 1 depicts a partner analysis grid representing the scale of interest and influence a partner may have [137].

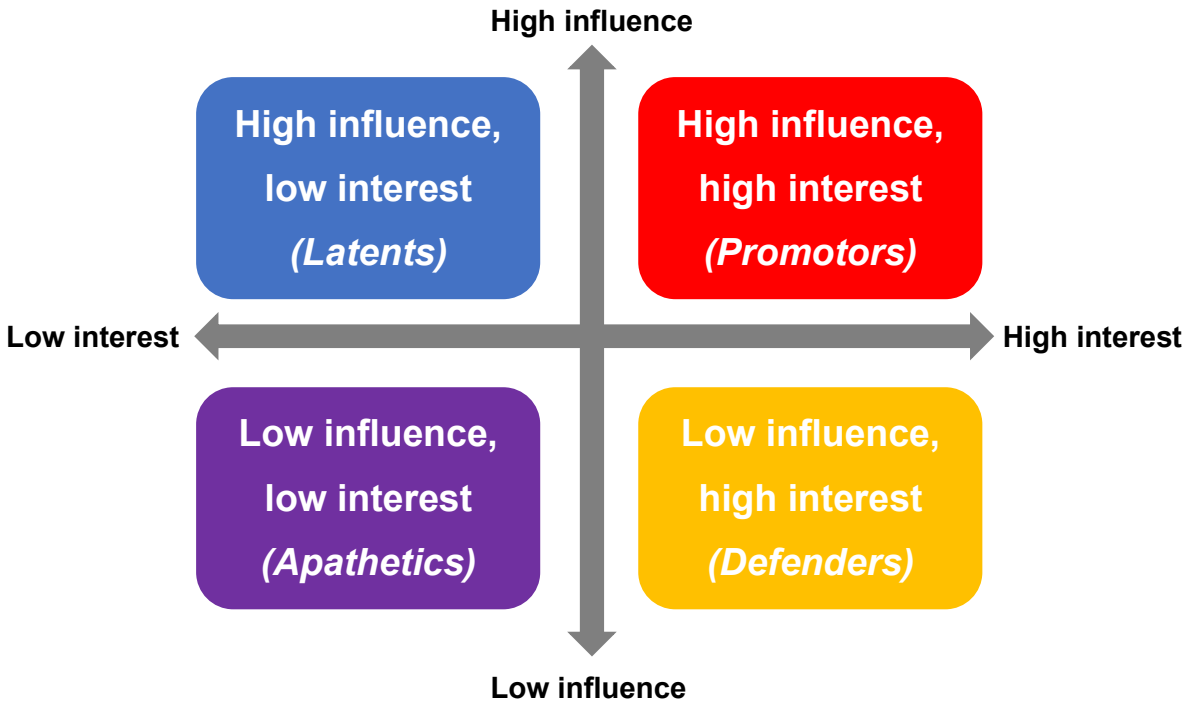


Figure 1: Partner Analysis Grid (adapted from Center for Community Health and Development [137]) demonstrating potential influence and interest of a partner

Partner categories include recipient, supporter, funder/commissioner/endorser, deliverer, manager, expert/researcher, coordinator, and organisational partners [142]. Roles and descriptions of partner categories are described in Table 2.

Table 2: Roles and descriptions of partner categories [142]

Role	Description
Recipient	The person who receives and is exposed to the intervention
Supporter	Unpaid carers (e.g. family) and other supporters

Funder / Commissioner/ Endorser	The person/s who directs funding to implement/deliver interventions
Deliverer	The person/s who delivers/administers the intervention to recipients
Manager	The individuals or teams that oversee the organisations that manage existing services, programs, or intervention settings
Expert / Researcher	The researchers that develop the evidence-base of effective interventions
Coordinator	Individual responsible for the day-to-day coordination and approaches
Organisational Partners	External organisation or provider who work in conjunction with the core team to support the delivery of the intervention

Partner sectors include health care and social assistance, education and training, social services, industry, community, professional, scientific and technical services (i.e. researchers and academics) and public administration and safety (i.e. government departments). Definitions and examples of partner sectors are described in Table 3.

Table 3: Definition and examples of partner sectors

Sector	Definition and examples
Health care and social assistance	Health sector refers to all preventive health, primary or secondary health care regardless of whether supports are delivered by the public or private system. Includes both state and federal funded health supports. *Examples: Hospitals, medical and other health care services, residential care services, childcare*
Education and Training	Education sector refers to all education supports for children or adults, whether public or private. This includes early education and care services.
Social Services	Social services sector refers to all types of supports that relate to welfare, regardless of whether supports are delivered by Department of Human Services, NGO, or charitable organisations. *Examples: Disability supports, domestic violence, child protection, financial support, poverty relief.*

Industry	Industry sector refers to industry and commercial businesses (outside of health and education), such as personal care services, retail, supermarkets.
Community	Community sector refers to community-based services that fall outside of the above sectors *Examples: Sport and recreation, arts and culture, local council supports (i.e. libraries), informal supports, faith-based services.*
Professional, Scientific and Technical Services	Research institutes and professionals
Public Administration and Safety	Government departments

PHC is predominately known to comprise a team of General Practitioners and nurses, however there are many other important partners to recognise to understand the broader context in which PHC operates. In this thesis, partner mapping demonstrates the interconnectedness and variety of services and supports that exist within and beyond PHC. The health sector includes a variety of services which support young children and their caregivers including PHC, hospitals, specialist services, SA ambulance service, providers for the National Disability Insurance Scheme (NDIS) and the National Immunisation Program Schedule (NIPS). These services can be categorised further. For example, PHC includes general practice, allied health services, administration, nursing, pharmacy, dental and aboriginal health services.

Prior to designing and conducting the studies within this thesis, comprehensive mapping of key partners relevant to the South Australian PHC context was conducted. See Table 4 for further details of PHC partners who have potential interest and influence on research to support children's growth, health, and development in the early years.

Table 4: Mapping of key partners relevant to the South Australian Primary Health Care (PHC) context

Role	**Sector** *(Health, Education, Social Services, Professional, Scientific and Technical Services, Public Administration and Safety or Community)*	**Category** *(Recipient, Supporter, Funder/Commissioner/ Endorser, Deliverer, Manager, Expert/ Researcher, Coordinator, Partners)*	**Level of interest** *(high/low/ unclear)*	**Level of influence** *(high/low/ unclear)*
Young children	Community	Beneficiaries	Unclear	Low
Caregivers (and families) of young children	Community	Beneficiaries	High	Low
PHC Practice Administration staff	Health	Recipient	Unclear	Low
PHC Practice Managers	Health	Manager	Unclear	High
Child and Family Health Service Nurse (CAFHS + MCaFHNA) *(PHC Practitioners)*	Health	Recipient	Unclear	High
General Practitioners *(PHC Practitioners)*	Health	Recipient	Unclear	High
PHC Nurses/Nurse Practitioners *(PHC Practitioners)*	Health	Recipient	Unclear	High
Allied Health Practitioners i.e. Dietitians, Physiotherapists, Occupational Therapists, Speech Pathologists, Social	Health	Recipient	Unclear	High

Worker, Oral Health and Dental Therapists *(PHC Practitioners)*				
Aboriginal Cultural Child and Family Support Consultants (ACCFSCs)	Health	Recipient	Unclear	High
State Government (SA)				
Wellbeing SA	Public Administration and Safety	Deliverer	High	High
Department for Health and Wellbeing	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High
Office of the Early Years	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High
Department of Human Services	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High
Department for Education	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High
Australian Federal Government				
Department of Health	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High
Department of Education, Skills, and Employment	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High
Department of Social Services	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High
Australian Institute of Health and Welfare (AIHW)	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High

Services Australia	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	High
Local Government/Council	Public Administration and Safety	Funder/Commissioner/Endorser	Unclear	Low
Academics/Lecturers	Professional, Scientific and Technical Services	Expert/Researcher	High	Low
Flinders University - Caring Future's Institute	Professional, Scientific and Technical Services	Expert/Researcher	High	High
The University of Adelaide	Education	Partner	Unclear	Low
The University of South Australia	Education	Partner	Unclear	Low
Early Childhood Education and Care (ECEC) professionals	Health	Partner	Unclear	Low
Child Development Council	Health	Partner	Unclear	Low
Adelaide Primary Health Network	Health	Partner	High	High
Country SA Primary Health Network	Health	Partner	Unclear	High
South Australian Rural Local Health Networks	Health	Deliverer	Unclear	Low
Northern Adelaide Local Health Network (NALHN)	Health	Deliverer	Unclear	Low

Southern Adelaide Local Health Network (SALHN)	Health	Deliverer	High	High
Central Adelaide Local Health Network (CALHN)	Health	Deliverer	Unclear	Low
Women's and Children's Health Network (WCHN)	Health	Deliverer	Unclear	Low
GP Plus Health Care Facilities	Health	Partner	Unclear	Low
Watto Purrunna Aboriginal Primary Health Care Service *(including Muna Paiendi and Wonggangga Turtpandi)*	Health	Partner	Unclear	Low
HealthPathways	Professional, Scientific and Technical Services	Partner	High	High
Healthy Development Adelaide	Professional, Scientific and Technical Services	Partner	High	Low
Flinders University - Health2Go	Professional, Scientific and Technical Services	Deliverer	High	Low
South Australian Health and Medical Research Institute (SAHMRI)	Professional, Scientific and Technical Services	Expert/Researcher	Unclear	Unclear

Commonwealth Scientific and Industrial Research Organisation (CSIRO)	Professional, Scientific and Technical Services	Expert/Researcher	Unclear	Unclear
Hospital Research Foundation	Professional, Scientific and Technical Services	Expert/Researcher	Unclear	Unclear
The Centre of Research Excellence in Translating Early Prevention of Obesity in Childhood (EPOCH)	Professional, Scientific and Technical Services	Expert/Researcher	High	High
The Australian Prevention Partnership Centre	Health	Expert/Researcher	High	Unclear
Non-government organisations NGO				
International Health Bodies (i.e. World Health Organisation WHO)	Health	Funder / Commissioner/ Endorser	High	High
Aboriginal Health Council of South Australia Limited (AHCSA)	Health	Funder / Commissioner/ Endorser	Unclear	Low

3.4 Thesis structure and methods

This research uses a multi-stage process to achieve the thesis aim and objectives. A series of inter-related studies informed by an integrated knowledge translation framework, The Knowledge to Action (KTA) Framework [23] were conducted to build the evidence-base for child health behaviour screening in Australian PHC.

The KTA Framework is a conceptual model which demonstrates the dynamic relationship between knowledge creation and action to support the facilitation and application of research into practice settings through a multi-phase process [23]. The KTA framework comprises two key concepts: Knowledge Creation and the Action Cycle, with each concept comprised of several phases and categories. Knowledge Creation includes knowledge inquiry, synthesis and tools/products and is represented as a funnel where knowledge is refined and tailored throughout the process [23, 143]. The Action Cycle surrounds the knowledge funnel and represents the activities that lead to the implementation and application of the knowledge. The phases of the action cycle are dynamic and include identifying a problem, reviewing knowledge relevant to the problem, adapting knowledge to a local context, assessing barriers to using the knowledge, tailoring and implementing interventions and the monitoring and evaluation of knowledge use, outcomes and sustainability of knowledge use [23, 143].

This thesis utilised both quantitative and qualitative methods to operationalise the KTA framework to simultaneously create, synthesise, and apply new knowledge on child health behaviour screening in PHC. Alignment of this thesis with the KTA framework is summarised in Table 5.

Table 5: Thesis alignment with Knowledge to Action (KTA) Framework [23]

KTA Concept	Concept Phase/Category	PhD related task	Thesis Chapter
Knowledge Creation	Knowledge Inquiry	**Study 1:** Desk-based review of Australian PHC Guidelines related to child health behaviours	Chapter 4
		Study 2: Systematic Review of health behaviour screening tools	Chapter 5
	Knowledge Synthesis	**Study 1:** Desk-based review of Australian PHC Guidelines related to child health behaviours	Chapter 4
		Study 2: Systematic Review of health behaviour screening tools	Chapter 5
	Knowledge Tools/Products	PHC Partner Mapping	Chapter 3
		SA Early Years System Map	Chapter 3
		Practitioner tools/resources	Chapter 7
		Implementation strategies	Chapter 8
	Tailoring Knowledge	Implementation strategies	Chapter 8
Action Cycle (Application)	Identify Problem	**Study 1:** Desk-based review of Australian PHC Guidelines related to child health behaviours	Chapter 4
		Study 2: Systematic Review of health behaviour screening tools	Chapter 5
	Identify, Review and Select Knowledge	**Study 1:** Desk-based review of Australian PHC Guidelines related to child health behaviours	Chapter 4
		Study 2: Systematic Review of health behaviour screening tools	Chapter 5
	Adapt Knowledge to Local Context	**Study 3:** Nominal Group Technique Workshops with PHC Practitioners	Chapter 6
	Assess Barriers to Knowledge Use	**Study 3:** Nominal Group Technique Workshops with PHC Practitioners	Chapter 6

	Select, Tailor, Implement Interventions	**Study 4:** Pilot Acceptability study	Chapter 7
	Monitor Knowledge Use	Future Research	Chapter 8
	Evaluate Outcomes	**Study 4:** Pilot Acceptability study	Chapter 7
	Sustain Knowledge Use	Future Research	Chapter 8

The thesis studies include a scoping review of Australian PHC guidelines (Chapter 4), a systematic review of international child health behaviour screening tools (Chapter 5), Nominal Group Technique workshops with PHC practitioners (Chapter 6) and a pilot feasibility and acceptability study in PHC (Chapter 7). The quantitative and qualitative methods for each study will be discussed in detail in each chapter. This section provides a high-level overview of how they function together in this thesis.

- A scoping review is a form of knowledge synthesis that uses a systematic and iterative approach to identify and synthesise an emerging body of literature [144, 145]. Scoping reviews are not limited to peer-reviewed published literature and can include a synthesis of grey literature such as government documents. Reporting follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist [146].
- A systematic review is a form of knowledge synthesis that follows a rigorous and structured approach to search, identify, and synthesise peer-reviewed and published literature [147]. Reporting follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist [148].
- The Nominal Group Technique is a collaborative consensus method to identify and prioritise answers to a research question from a group of participants [16, 17, 149-153]. This method supports knowledge creation and application, tailoring knowledge to local context and priorities. Reporting follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement [154].
- A multi-method acceptability and feasibility study is a proof-of-concept method to understand if it is acceptable and feasible to deliver an intervention prior to a larger scale implementation-effectiveness trial. This study design allowed us to select, tailor, and implement an intervention in a real-world PHC setting. Reporting follows the Consolidated Standards of Reporting Trials (CONSORT) 2010 statement: extension to randomised pilot and feasibility trials [155].

3.5 Ethical considerations

Ethics approval was obtained from the Flinders University Human Research Ethics Committee for Study 3 (HREC 6514, Appendix 7) and Study 4 (HREC 7220, Appendix 17) and the Women's and Children's Health Network Human Research Ethics Committee for Study 3 (HRE00322, Appendix 8).

All participants provided informed consent prior to participating. PHC practitioners were remunerated for their participation in Study 3, in line with SA Health policy. Caregivers who participated in virtual interviews (Study 4) were remunerated with a $30AUD gift card.

All research data and information have been stored electronically on a secured and private Flinders University server, only accessible to the research team. All data is deidentified and will be stored for 7 years until it is destroyed according to university protocols. The research studies were conducted in line with approved research protocols.

3.6 Chapter Summary

This chapter has provided an overview of the pragmatic multi methods approach used to address the thesis aim and objectives. The Knowledge to Action Framework provides an evidence-based theoretical framework to support knowledge creation and application into real-world PHC settings. Description of researcher positionality and ethical considerations demonstrate researcher reflexivity, and a strong understanding of the epistemological perspective as part of good research conduct. Further detail of the methods for each study will be discussed in subsequent chapters.

4 AUSTRALIAN PRIMARY HEALTH CARE GUIDELINES FOR CHILDHOOD GROWTH, HEALTH, AND DEVELOPMENT IN THE EARLY YEARS: A SCOPING REVIEW

4.1 Chapter Overview

This chapter addresses Objective 1 of the thesis and presents the results of Study 1.

Relevant Thesis Objective: Understand current Australian practice guidelines for primary health care that provide recommendations for the monitoring and promotion of child health behaviours in the early years (Objective 1).

A version of this chapter has been published in peer-reviewed journal Australian and New Zealand Journal of Public Health (Appendix 3). The chapter and publication work were conceptualised and led by the PhD candidate, contributing 90% of the work (See co-author approvals in Appendix 1).

Citation: Dutch D, Bell L, Hunter S, Johnson J, Denney-Wilson E, and Golley K. Australian Primary Health Care guidelines for childhood growth, health, and development in the early years: A scoping review. *Australian and New Zealand Journal of Public Health*. 2025; 49(3): 100248. https://doi.org/10.1016/j.anzjph.2025.100248

Co-author contributions: Dimity Dutch (DD) conducted document searches, data extraction and synthesis. Lucy Bell (LB), Sarah Hunter (SH), Brittany J Johnson (BJJ), Elizabeth Denney-Wilson (EDW) and Rebecca K Golley (RKG) provided study oversight, including agreement on included documents, data extraction, results synthesis, and interpretation. LB, SH, BJJ, EDW and RKG provided supervision and guidance to DD. DD drafted the manuscript, and all authors contributed to the interpretation of the results and critical review of the manuscript. All authors read and approved the final manuscript.

4.2 Abstract

Objective: To identify and synthesise recommendations for growth monitoring, health behaviour screening, and health promotion advice within current Australian documents that guide Primary Health Care (PHC) practitioners to support childhood growth, health, and development in the early years.

Methods: Documents were identified using Google Advanced Search and targeted website searching. An iterative inductive and deductive content analysis was conducted and contextualised using the *5W (who, what, when, where, why) + 1H (how) Framework*.

Results: All included documents (n = 18) recommended growth monitoring. Recommendations to screen and promote child health behaviours (diet, physical activity, sedentary behaviour and sleep) were fragmented and provided limited guidance on *how* to screen and promote child health behaviours in practice.

Conclusions: Documents recognised the importance of screening and promoting child health behaviours in PHC, however comprehensive recommendations were limited. Practical tools and resources are needed to enable PHC practitioners to conduct effective and appropriate screening and health promotion, and across all four health behaviour domains.

Implications for Public Health: There is an opportunity for guidelines to recommend and integrate health behaviour screening tools into routine PHC practice to better support children's growth, health, and development in the early years.

Keywords: Screening, Monitoring, Health Behaviours, Health Promotion, Growth Monitoring

4.3 Introduction

The early years (birth to five years) are a critical stage of development, rapid growth, and laying foundations for behaviours that influence health including dietary intake, physical activity, sedentary behaviour, and sleep [34, 42, 156]. International guidelines [157] recognise the importance of establishing positive health behaviours in the early years to support optimal child health and future health given health behaviours track into adolescence and adulthood [32, 33]. In Australia, there are several key national policy documents that support a focus on health promotion in the early years [5, 21, 75, 87, 88]. Briefly, key themes include improving the quality and access of integrated and universal health care and prioritising preventive health. The Australian Dietary Guidelines [30] and 24 Hour Movement Guidelines for the Early Years (birth to five years) [31] provide national recommendations for a child's dietary intake, physical activity, sedentary behaviour, and sleep to support optimal growth, health, and development. Therefore, supporting children to establish positive health behaviours is a key preventive health strategy, to enable children to have the best start to life and have long term health impact.

Primary Health Care (PHC) is an umbrella term for the settings that children and caregivers access for preventive health care, including general practice, maternal and child health nurse clinics, community health services and allied health settings. PHC in Australia is a familiar and valued setting for caregivers of young children due to the longitudinal and trusting relationships developed from regular encounters, particularly in the early years [72]. Regular encounters may include routine health checks, immunisation, and multidisciplinary appointments, facilitated in general practice, allied health, and children and family health services and enabled by standardised, evidence-based screening and assessment tools [91]. Core elements of universal health services for children and families include growth, health, and developmental screening and monitoring, health promotion, early identification of family need and risk, and responding to identified need through education and intervention [158]. Table 6 demonstrates the alignment of the core service elements of universal child and family health services with the 5A's *(ask, assess, advise, assist/agree, and arrange) Framework.* The 5A's Framework articulates the importance of monitoring, assessment in conjunction with the provision of advice and support to facilitate positive health behaviour change [97]. PHC is therefore an ideal and opportunistic setting for preventive practice and is essential for achieving a multidisciplinary, holistic, and universal approach to support optimal growth, health, and development in the early years.

Table 6: Core Service Elements of Universal Child and Family Health Services [158] and alignment with the 5A's Framework [97]

Core Service Elements of Universal Child and Family Health Services [158]	**5As Framework** [97]
Developmental surveillance and health monitoring • Monitoring physical, social, and emotional and cognitive development • **Physical health, growth monitoring,** oral health • Vision and hearing assessment • Assessment of family psychosocial risk and protective factors	ASK ASSESS
Health promotion • **Prevention of disease**, illness, and injury • **Health education and anticipatory guidance** • **Support for mothers, fathers, and carers** • Community capacity building	ADVISE ASSIST
Early identification of family need • Identify the factors known to increase the likelihood of a child experiencing poorer health, development, and wellbeing outcomes • Work with parents, families, and communities to build strengths and address needs • Facilitate and coordinate where appropriate, support across multiple services	ASSIST ARRANGE
Responding to identified need • **Information, advice, and assistance** • **Brief practice-based interventions** • **Referral for further assessment and diagnosis** • Referral or invitation for further support within universal health services • Referral for additional or enhanced targeted services • Respond appropriately to child protection concerns	ADVISE ARRANGE

In Australia, maternal, child, and family health services delivered by State and Territory Governments are a key provider of universal preventive health care to children and their families in the early years. However, 2023 data suggests that approximately 1.5 million Australian children aged 0-4 years visited a general practitioner, with an average of 5.7

consultations per child [159]. General practice and maternal, child, and family health services are recognised as important for the provision of anticipatory guidance and health surveillance in young children [160]. However, given each Australian State and Territory deliver their own unique PHC services to children and families, the content and context of the tools and recommendations across different Australian jurisdictions may differ.

Therefore, this review aimed to identify and synthesise current recommendations within Australian documents that guide PHC practitioners to screen and promote child health behaviours and growth in the early years (birth to five years).

4.4 Aim & Objectives

Aim: To identify and describe current advice and recommendations within Australian national, state and practitioner documents that guide Primary Health Care (PHC) practitioners to support optimal growth, health, and development of children in the early years (birth to five years).

Objectives:

1. To identify and describe current recommendations for child health behaviour screening, monitoring, and surveillance by PHC practitioners in the early years
2. To identify and describe current recommendations for weight-based screening, monitoring, and surveillance by PHC practitioners in the early years
3. To identify and describe current health promotion advice/recommendations for child health behaviours for PHC practitioners to provide to families in the early years

4.5 Methods

4.5.1 Study Design

This qualitative study is an online desk-based scoping review and content analysis of Australian guidelines, frameworks, and documents that guide Primary Health Care (PHC) practitioners when working with children and their caregivers in the early years (birth to five years).

Reporting follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) [146] checklist (Appendix 2).

4.5.2 Eligibility criteria

Eligibility criteria including the population, outcomes of interest, document type and other are described below and in

Table 7.

4.5.2.1 Population

Documents that included guidance for PHC practitioners (i.e. general practitioners, allied health practitioners, and maternal and child health nurses) on screening, monitoring, and health promotion advice related to children in the early years provided in Australian PHC settings were eligible for inclusion. Documents that included guidance for specialist or tertiary health care practitioners were not eligible for inclusion.

4.5.2.2 Outcomes of interest

Advice related to screening, monitoring, or surveillance of multiple health behaviours domains including dietary intake, physical activity, sedentary behaviour, and sleep was included. Advice related to growth monitoring was also included if other health behaviours were also described.

4.5.2.3 Document type

Australian national and state/territory level documents that provide guidance for PHC practitioners (e.g. child health records which are used to guide Australian PHC consultations in the early years).

4.5.2.4 Other

The searches were limited to documents published in English within the last 15 years (from 2007) to capture current (i.e. active) guideline and policy documents and a filter for region (Australia only) was applied. Only the latest and current version of documents were included. Rescinded documents were not eligible for inclusion.

Table 7: Scoping Review Eligibility Criteria

	INCLUSION	**EXCLUSION**
POPULATION	Advice relevant to: • Children aged birth – 4.9 years (mean age within range) • Australian PHC settings • PHC practitioners (i.e. general practitioners, allied health practitioners) and maternal and child health nurses	Advice relevant to: • Children aged >5 years • Settings other than PHC (i.e. hospitals, schools, specialist services, community centres) • Specialists, tertiary care clinicians
OUTCOMES OF INTEREST	Advice relating to screening/ monitoring/surveillance of multiple health behaviours in PHC during the early years, including: • Diet/Infant Feeding • Physical activity • Sleep (i.e. routines, timing, safety) • Sedentary behaviour (i.e. screen-time) • Growth monitoring (i.e. height, weight, length, BMI, growth charts)	Advice relating to screening/monitoring/surveillance of health behaviours in the early years, for a specific context including: • Specific condition or disease (i.e. cystic fibrosis, asthma) • Specific circumstance (i.e. foster care/out of home care) • Only one health behaviour (i.e. sleep concerns) • Developmental monitoring • Weight management of children who are overweight or obese

DOCUMENT TYPE	Australian national, state/territory and practitioner level documents that provide guidance on PHC practice	• Local and international documents • Documents that do not provide guidance for practice (higher level, service planning, policy, program informing documents) • Published scientific literature i.e. research articles, systematic/narrative reviews, meta-analyses • Evidence briefs • Research reports
OTHER	• Documents written in English • Documents published within the last 15 years	• Non-English documents • Documents published more than 15 years ago

4.5.3 Search strategy and information sources

The search strategy for this review incorporated three strategies:

1. Google search engine (July-August 2022)
2. Target website searches (August-September 2022)
3. Consultation with experts (October 2022-December 2023)

The search was re-run in December 2024, and an updated version of two included guidelines were identified.

4.5.3.1 Google search terms

Search strategies were formulated considering sensitivity and specificity. Sensitivity to identify as many relevant records as possible to contribute to the review while also balancing specificity and precisions so that screening was feasible.

Search terms were entered using Google Advanced Search. Search terms included:

- Health behaviours (i.e. diet, physical activity, sleep, and sedentary behaviour)
- Guidelines (i.e. practice guidelines, position statements, policy, advice recommendations, frameworks)
- Children (i.e. infant, children, toddler)
- Screening and monitoring

Details of the first 50 webpages of results were retrieved and checked against the eligibility criteria.

4.5.3.2 Targeted website searching

Based on previous mapping of key PHC partners conducted by the research team (presented in Chapter 3, Section 3.3.3), the following websites were searched:

- Health practitioner associations / networks
- Australia state and federal government departments
- Non-government organisations
- Research organisations
- Community groups

Targeted website searching included searching the maternal, child, and family health services of all Australian jurisdictions.

4.5.3.3 Expert consultation

After collating the results from the Google Advanced Search and targeted website searching, researchers from the Centre for Research Excellence in Translating Early Promotion of Optimal Child Growth (CRE EPOCH-Translate, https://earlychildhoodobesity.com/) were consulted to identify any additional documents for inclusion in the review. The CRE EPOCH-Translate is a multidisciplinary network of leading researchers, practitioners, and policymakers across Australia and internationally with a mission to identify and implement effective approaches to promote child health behaviours in the early years.

4.5.4 Selection process

Document selection was undertaken by one researcher (DD) with expertise as a dietitian and experience conducting systematic reviews. Documents were screened against the a priori defined eligibility criteria in two stages: 1) webpage title and summary screening and 2) full webpage screening.

4.5.5 Data extraction

Data were extracted by one researcher (DD) using Microsoft Excel (Version 2304). Data extraction tools were pilot tested and confirmed by the wider research team prior to use. Data extracted included descriptive information about the documents and recommendations provided within documents related to growth and child health behaviours. Descriptive document information included document name, author, URL, date of publication, target audience and aim/s. Recommendations for health behaviour screening, health promotion advice and recommendations for growth monitoring were extracted verbatim for comparison between documents. Data extraction was reviewed and confirmed by the entire research team.

4.5.6 Data analysis and synthesis

This review employed a content analysis and synthesis of text taken from online information sources; information sources being Australian documents that guide PHC practitioners to monitor and promote child health behaviours in the early years. This approach involved systematically analysing information in documents, with the aim of condensing and coding the documents to generate a list of themes, sub-themes, and synthesis of content[161]. A three-stage analysis approach (Figure 2) was required as knowledge of the health behaviour and growth monitoring screening and promotion recommendations in Australian practice guidelines is poor.

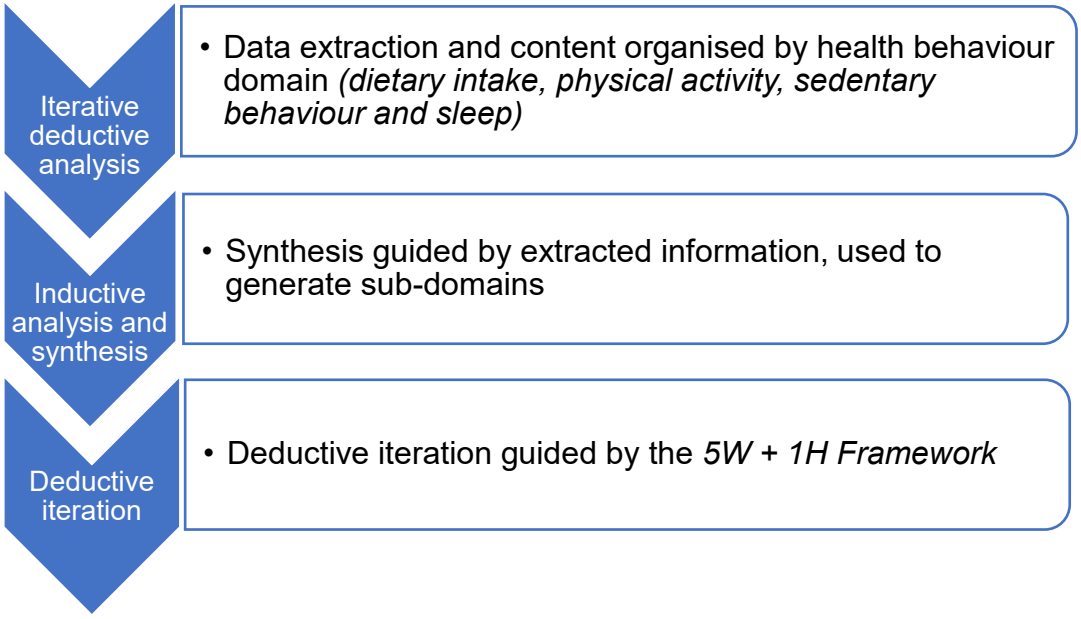


Figure 2: Three-stage approach for scoping review data analysis and synthesis

Firstly, recommendations from the documents were extracted and organised by health behaviour domain (i.e. dietary intake, physical activity, sedentary behaviour and sleep). Second, an inductive analysis and synthesis of extracted information generated sub-domains (i.e. milk feeding, amount of physical activity). Finally, data were synthesised using the *5W (who, what, when, where, why) + 1H (how) Framework* to support a comprehensive understanding of the content and context of the included documents [162] (Table 8).

Table 8: Scoping Review Guiding 5W + 1H Framework

Framework Domain	Screening	Health Promotion
WHO	Responsibility i.e. caregiver or practitioner screening questions	Who the health promotion information is targeted for i.e. information presented for caregivers OR directed at practitioners to discuss with caregivers
WHAT	Health behaviour sub-domains to screen	Health behaviour sub-domains to promote
WHEN	Timing and frequency of screening i.e. opportunistically, annually, once off, during some or all child health check appointments or not specified Excludes screening done in hospital i.e. discharge feeding status or anthropometric measures	When to promote behaviours i.e. opportunistically, annually, once off, during some or all child health check appointments or not specified Excludes health promotion provided in hospital
WHERE	Primary Health Care	
WHY	To support optimal child growth, health, and development	
HOW	Strategies to screen for the health behaviour or growth – screening: tick box answers, screening tool, not specified, use of growth charts	How to achieve recommendation i.e. specific strategies to achieve optimal behaviour or age-specific recommendations (hours/day or how much)

Data are presented as a narrative synthesis with a summary table of included practice guidelines, summary table of health behaviour screening recommendations and health promotion advice. This approach supported understanding of what guiding information already exists and allowed for identification of gaps in information. This can subsequently enable the development of recommendations to improve guideline documents and thus ultimately improve practice within PHC.

Analysis and synthesis were conducted by one person (DD), with regular team analysis meetings occurring (DD, RG, SH, BJ, EDW, LB) to clarify, refine, and achieve consensus on sub-themes and key findings. DD maintained a reflexive journal and in-depth record-keeping across all stages of data analysis.

4.5.7 Researcher positionality

The research team brings together expertise in public health (RG, LB, BJ, SH, EDW, DD), dietetics (RG, LB, DD, BJ), nursing (EDW) and psychology (SH). Data collection was conducted by DD who is a white female and approached this research from a background in dietetics. DD is completing a PhD which is investigating embedding child health behaviour screening within routine PHC as a strategy to support optimal child growth, health, and development. The analysis team (RG, LB, SH, BJ, and EDW) comprised white females experienced in researching health behaviour measurement, public health interventions, implementation science and research in PHC.

4.6 Results

4.6.1 Overall summary of documents

Figure 3 describes the PRISMA flow chart of the identification, screening, and number of included documents.

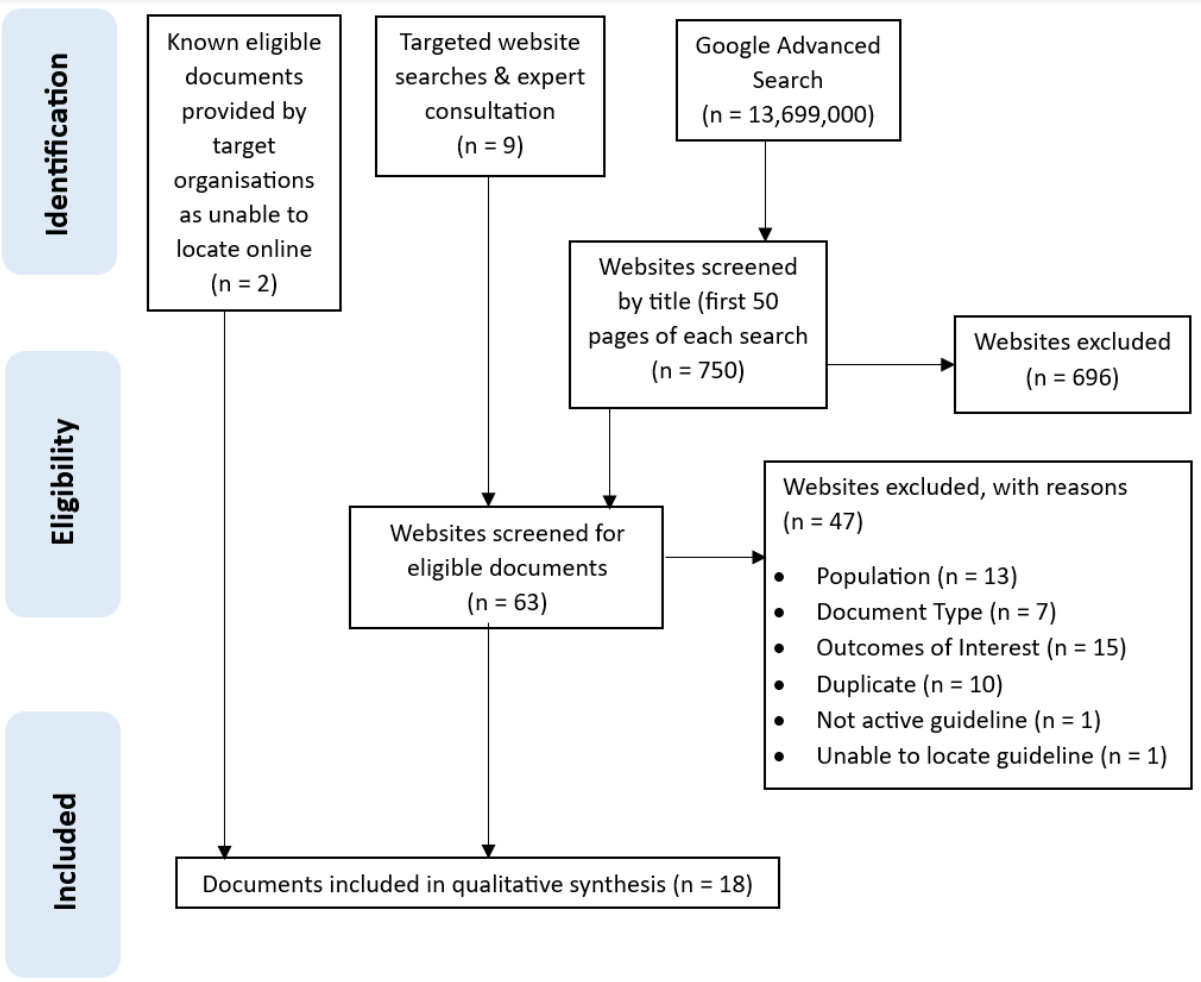


Figure 3: Scoping Review PRISMA Flow Chart

Table 9 provides an overview of the individual search term combinations and google advanced searching results. Following screening, 18 documents were included in the review.

Table 9: Scoping Review Google Advanced search terms and results

Date of Search	Search term combination	Total number of results	Number of websites screened	Number of documents included
19/07/2022	Health Behaviour AND Guideline AND Children AND Screening	1,850,000	5	4
19/07/2022	Diet AND Guideline AND Children AND Screening	186,000	5	0
19/07/2022	Physical Activity AND Guideline AND Children AND Screening	492,000	4	1
4/08/2022	Sleep AND Guideline AND Children AND Screening	263,000	10	3
4/08/2022	Sedentary Behaviour AND Guideline AND Children AND Screening	31,700	2	0
8/08/2022	Health Behaviour AND Guideline AND Infant AND Screening	1,630,000	6	1
8/08/2022	Diet AND Guideline AND Infant AND Screening	97,600	6	1
8/08/2022	Physical Activity AND Guideline AND Infant AND Screening	2,620,000	2	0
8/08/2022	Sleep AND Guideline AND Infant AND Screening	180,000	4	2
8/08/2022	Sedentary Behaviour AND Guideline AND Infant AND Screening	32,900	3	0

8/08/2022	Health Behaviour AND Guideline AND Toddler AND Screening	2,240,000	2	0
8/08/2022	Diet AND Guideline AND Toddler AND Screening	92,100	1	0
8/08/2022	Physical Activity AND Guideline AND Toddler AND Screening	3,680,000	1	0
8/08/2022	Sleep AND Guideline AND Toddler AND Screening	236,000	1	0
8/08/2022	Sedentary Behaviour AND Guideline AND Toddler AND Screening	37,700	2	0

Table 10 describes the characteristics of national (n = 4), state/territory (n = 6) and practice level (n = 8) documents included in the review that guide Primary Health Care (PHC) practitioners to support optimal growth, health, and development in the early years (birth to five years). Three documents [55, 97, 163] were published by a non-government organisation, the Royal Australian College of General Practitioners (RACGP), including one document specifically for Aboriginal and Torres Strait Islander people [163]. All other documents (n = 15) were published by Federal or State/Territory Health departments. Intended target audiences for documents included child, maternal, and family health nurses, general practitioners, allied health staff and other practitioners in PHC settings. For practice level documents (n = 8), caregivers were an additional target audience. Intended PHC settings included both clinical practice and community health settings across metropolitan, rural, and remote Australia

Table 10: Characteristics of documents that guide PHC practitioners to support optimal growth, health, and development in the early years

Document name	Author	Sector and department	Year	Target PHC practitioners and intended child age	Recommendations for screening					Health Promotion advice				
					Diet n=11	PA n=3	SB n=3	Sleep n=6	Growth n=18	Diet n=18	PA n=15	SB n=10	Sleep n=16	Growth n=10
NATIONAL DOCUMENTS (n = 4)														
1. National Framework for Universal Child and Family Health Services [158]	Australian Government, Department of Health and Ageing	Government, Health	2011	Child and Family Health Nurses, General Practitioners and Allied Health Children aged 0-8 years	-	-	-	-	✓	✓	✓	-	-	-
2. Smoking, nutrition, alcohol and physical activity (SNAP): A population health guide to the behavioural risk factors in general practice (2nd Edition)[a] [55]	Royal Australian College of General Practitioners (RACGP)	Non-government organisation	2015	General Practitioners and practice staff All ages, children aged 0-5 years included	-	-	-	-	✓	✓	✓	✓	-	✓
3. Guidelines for Preventive Activities in general practice	Royal Australian College of General	Non-government organisation	2024	General Practitioners	-	-	-	-	✓	✓	✓	✓	✓	-

(10th Edition) *(Red Book)*[a] [97]	Practitioners (RACGP)			All ages, children aged 0-5 years included										
4. National guide to preventive healthcare for Aboriginal and Torres Strait Islander people (4th Edition) [163]	National Aboriginal Community Controlled Health Organisation (NACCHO) and Royal Australian College of General Practitioners (RACGP)	Non-government organisation	2024	PHC practitioners All ages, children aged 0-5 years included	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
STATE/TERRITORY DOCUMENTS (n = 6)														
1. Maternal and child health service practice guidelines [164]	Victorian Government, Department of Health and Human Services	Government, Health	2009[b]	Maternal and Child Nurses Children aged 0-5 years	✓	-	-	✓	✓	✓	-	-	✓	✓
2. Community Health Clinical Nursing Manual [165]	Government of Western Australia; Child and Adolescent Health Service	Government, Health	2017[c]	Child and Adolescent Community Health Professionals Children aged 0-18 years	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

3. Canberra Hospital and Health Services Clinical Procedure; Maternal and Child Health Procedures in the ACT [166]	ACT Government	Government, Health	2018	Maternal and Child Nurses + Midwives Children aged birth to six years	-	-	-	-	✓	✓	-	-	✓	✓
4. Chronic Conditions Manual: Prevention and Management of Chronic Conditions in Rural and Remote Australia (2nd Edition) [167]	Queensland Health, Royal Flying Doctor Service (Queensland Section) and Apunipima Cape York Health Council	Government, Health	2020	Rural and remote health care practitioners All ages, children aged birth to five years included	✓	✓	✓	-	✓	✓	✓	✓	✓	-
5. Child and Youth Health Practice Manual [168]	Queensland Child and Youth Clinics Network (Child Health sub-network), Queensland Health Queensland	Government, Health	2020	General Practice, Midwives, Child health nurses, Aboriginal and Torres Strait Islander health practitioners,	-	-	-	-	✓	✓	✓	✓	✓	✓

	Hospital and Health Service			psychologists & social workers Children 0-18 years										
6. Guideline: Assessing infant / child nutrition, growth and development, within the primary health care setting [169]	Queensland Government	Government, Health	2022	PHC practitioners Children 0-5 years	✓	-	-	-	✓	✓	✓	✓	✓	-
PRACTICE LEVEL DOCUMENTS (n = 8)														
1. Purple Book [170]	Government of Western Australia, Child and Adolescent Health Service	Government, Health	2018	Caregiver & Practitioner Children 0-5 years	✓	-	-	-	✓	✓	✓	-	✓	-
2. My Child Health Record (Yellow Book) [171]	Northern Territory Government, Department of Health	Government, Health	2018	Caregiver & Practitioner Children 0-5 years	✓	-	-	✓	✓	✓	✓	✓	✓	-
3. My Health and Development Record (Blue Book) [172]	Government of South Australia, Child and Family Health Service	Government, Health	2021	Caregiver & Practitioner Children 0-5 years	✓	-	-	✓	✓	✓	-	-	✓	-

4. My personal health record (Blue Book) [173]	New South Wales Government, NSW Ministry of Health	Government, Health	2022	Caregiver & Practitioner Children 0-5 years	✓	-	-	-	✓	✓	✓	✓	✓	✓
5. Personal Health Record (Red Book)[d] [174]	Queensland Government, Queensland Health	Government, Health	2022	Caregiver & Practitioner Children 0-5 years	-	-	-	-	✓	✓	✓	✓	✓	✓
6. My Personal Health Record Book (Blue Book) [175]	Australian Capital Territory Government, ACT Health	Government, Health	2022	Caregiver & Practitioner Children 0-5 years	✓	-	-	✓	✓	✓	✓	-	✓	✓
7. My Health, Learning and Development Record (Green Book) [176]	Victorian Government, Department of Health	Government, Health	2022	Caregiver & Practitioner Children 0-5 years	-	-	-	-	✓	✓	✓	-	✓	-
8. Personal Health Record (Blue Book) [177]	Tasmanian Government, Tasmanian Health Service, Child Health and Parenting Service	Government, Health	2023	Caregiver & Practitioner Children 0-5 years	✓	-	-	-	✓	✓	✓	-	✓	✓

[a]Supported by an implementation guide [178]
[b]Reissued 2019 (without revision)
[c]First issued in 2017, then 2020/ 2022 (amendments)
[d]Supported by a parent information booklet [179]
Abbreviations: PA: physical activity, PHC: Primary Health Care, SB: sedentary behaviour

4.6.2 Health behaviour screening and growth monitoring recommendations

Eleven of the included documents provided recommendations for health behaviour screening across at least one domain – dietary intake, physical activity, sedentary behaviour, or sleep. Only two documents provided recommendations to screen across all four health behaviours domains, a Community Health Clinical Nursing Manual published by the Government of Western Australia [165] and the National guide to preventive healthcare for Aboriginal and Torres Strait Islander people (4th Edition) [163]. Recommendations to screen for dietary behaviours was most common (n = 11), followed by sleep (n = 6), physical activity (n = 3) and sedentary behaviour (n = 3). All included documents provided recommendations for growth monitoring (n = 18). Recommendations as per the *5W + 1H Framework* are summarised in Table 11.

4.6.2.1 Who

Recommendations for screening for dietary intake was targeted for both caregivers (n = 5) and practitioners (n = 6). Only three documents recommended screening for physical activity and/or sedentary behaviour and both were recommendations targeted for practitioners to conduct screening [163, 165, 167]. Within the documents that recommended screening for sleep behaviours (n =6), recommendations were predominantly targeted for caregivers [164, 165, 171, 172, 175]. The National guide to preventive healthcare for Aboriginal and Torres Strait Islander people (4th Edition), provided recommendations for screening sleep behaviours targeted for the practitioner [163].

Growth monitoring recommendations were targeted to practitioners (n = 16), except for two documents which encouraged caregivers to measure growth [171, 172].

4.6.2.2 What

For each health behaviour domain, documents included various sub-domains to review. For dietary intake this included milk feeding (n = 10), solid food intake (n = 8), beverage intake (n = 5), elimination (n = 3), and caregiver concerns about dietary intake (n = 2). For physical activity, this included amount of physical activity (n = 3) and the type of physical activity (n = 1). For sedentary behaviour, this included amount of sedentary behaviour (n = 2) and reviewing screen time (n = 1). For sleep, this included sleep safety (n = 5), sleep routine and patterns (n = 2), caregiver concerns about child sleep (n = 2) and sleep settling (n = 1).

Growth monitoring was recommended in all documents through anthropometric measures including child weight, length, head circumference, waist circumference and/or Body Mass Index from 2 years of age. Two documents recommended measurement of waist

circumference [55, 167] and fourteen documents recommended recording anthropometric measures in medical records [55, 168], electronic records [165, 168] or child health record [165, 166, 168-177].

4.6.2.3 When

Screening for dietary intake behaviours was primarily recommended during child health checks (n = 9). Two documents recommended to screen dietary intake opportunistically [163, 169], while one document recommended only screening for dietary intake annually [167]. Of the three documents that recommended screening for physical activity and sedentary behaviour, one included recommendations for screening opportunistically and annually [163], one recommended screening during child health checks [165] and the other document did not specify when to screen [167]. Of the six documents that recommended screening for sleep behaviours, five recommended screening to occur as part of routine child health checks [164, 165, 171, 173, 175] and one recommended screening opportunistically [163].

Monitoring growth, through child anthropometric measures, was most recommended during child health checks (n = 15). One document recommended growth monitoring opportunistically, annually and in line with immunisations [163], one document described measuring growth every two years [55], whilst two documents did not specify when to monitor growth [158, 176].

4.6.2.4 How

Screening recommendations typically described *'reviewing'* or *'assessing'* health behaviours in general, rather than screening using a specific tool. Only two documents referred to a health behaviour screening tool, including a safe sleeping checklist [164] and the BEARS sleep screening tool [163]. All other documents included either open-ended statements or questions only (n = 4), tick box yes/no response options only (n = 4) or a combination of both (n = 3).

In contrast, growth monitoring had more specific recommendations on how to conduct screening, with 17 of the included 18 documents describing the use of age- and sex-specific growth charts as a strategy to monitor children's growth. Fifteen documents included the different versions of the growth charts, with (n = 11) or without (n = 4) information on how to plot, interpret and assess outcomes.

Table 11: Synthesis of health behaviour screening and growth monitoring recommendations according to 5W + 1H Framework

Domain	Framework^	Sub-domain	Synthesis of screening recommendations included in guidelines
Diet	WHO	(n = 11)	Caregivers [164, 171, 173, 175, 177] Practitioners [163, 165, 167, 169, 170, 172, 177]
	WHAT	Milk Feeding[a] (n = 10)	Review type of milk feeding [164, 165, 169-171, 175], review breastfeeding status i.e. predominately/partially [164, 167, 169, 171-173, 177], infant formula intake [165, 167, 171, 173, 177] or intake of other milks i.e. cow's milk, soy milk, evaporated etc [173, 177] Review frequency of milk feeding [164, 165]
		Solid food intake (n = 8)	Review progress of solids introduction [164, 169, 171] Review solids progress into family foods [164] Review solids intake [165, 167, 173, 175, 177] Review discretionary choices intake [167, 173]
		Beverage intake (n = 5)	Review intake of other fluids [165, 167, 175] including water, sweetened/flavoured water, fruit juice or tea/infusions [173, 177]
		Elimination (n = 3)	Review output (wet nappies, bowel motions etc) [164, 165, 169]
		Caregiver concerns (n = 2)	Review caregiver worries or concerns regarding breastfeeding [165] or child's eating [171]
	WHEN	(n = 10)	Opportunistically [163, 169] During Child Health Check/s [164, 165, 169-173, 175, 177]

			Annually [167]
	HOW	(n = 10)	Tick box OR Yes/No questions [167, 170-173, 177] Open-ended question/statement [164, 165, 167, 169, 171, 175]
Physical Activity	WHO	(n = 3)	Practitioners [163, 165, 167]
	WHAT	Amount of physical activity (n = 3)	Assess amount of physical activity as per the Australian age-appropriate recommendations [163, 167] Review physical activity patterns if BMI under 5th or over 85th percentile [165]
		Type of physical activity (n = 1)	Review types of infant's daily floor-based play (i.e. tummy time, rolling, crawling, cruising etc.) [167] Review types of child's daily activities [167]
	WHEN	(n = 3)	Opportunistically [163] During Child Health Check/s [165] Annually [163] Not specified [167]
	HOW	(n = 3)	Tick box OR Yes/No questions [167] Open-ended question/statement [163, 165, 167]
	WHO	(n = 3)	Practitioners [163, 165, 167]

Sedentary Behaviour	WHAT	Amount of sedentary behaviour (n = 2)	Assess amount of sedentary behaviour as per the Australian age-appropriate recommendations [163] Review sedentary activity patterns if BMI under 5th or over 85th percentile [165]
		Screen time (n = 1)	Review screen time [167]
	WHEN	(n = 3)	Opportunistically [163] During Child Health Check/s [165] Annually [163] Not specified [167]
	HOW	(n = 3)	Tick box OR Yes/No questions [167] Open-ended question/statement [163, 165, 167]
Sleep	WHO	(n = 6)	Caregivers [164, 171, 173, 175] Practitioners [163, 165]
	WHAT	Sleep safety (n = 5)	Review risk factors for Sudden Infant Death Syndrome (SIDS) [164, 165, 171, 173, 175]
		Routine and patterns (n = 2)	Review child's sleep routine and patterns (i.e. bedtime routine, normal sleep cycles, number and duration of daytime naps, quality of sleep) [164, 165]
		Caregiver concerns (n = 2)	Review caregiver worries or concerns regarding child's sleeping [165, 171]
		Settling (n = 1)	Review if baby is settled between feeds [171]

	WHEN	(n = 6)	Opportunistically [163] During Child Health Check [164, 165, 171, 173, 175]
	HOW	(n = 6)	Tick box OR Yes/No questions [171, 173, 175] Screening tool – safe sleeping checklist [163, 164] Open-ended question/statement [164, 165]
Growth	WHO	(n = 18)	Caregivers [171, 172] Practitioners [55, 97, 158, 163-170, 173-177]
	WHAT	Anthropometric Measures[b] (n = 18)	Measure weight, length and/or head circumference [97, 158, 163-177] Measure BMI from 2 years of age [55, 97, 164-168, 173-175] Measure waist circumference [55, 167] Record anthropometric measures in medical records [55, 168] or electronic records [165, 167], or child health record [165, 166, 168-177]
	WHEN	(n = 18)	Opportunistically [163] During Child Health Check/s [97, 163-175, 177] In line with immunisations [97, 163] Annually [163]

			Every 2 years [55] Not specified [158, 176]
	HOW	Growth Charts[c] (n = 17)	Document includes and describes CDC and WHO age and sex-specific growth charts to plot, interpret and assess weight, height, length, head circumference and/or BMI (from 2 years of age) [55, 97, 158, 163, 166-169, 172-174, 177] Document describes CDC and WHO age and sex-specific growth charts to plot, interpret and assess weight, height, length, head circumference and/or BMI (from 2 years of age), but does not provide them [165] Document includes CDC and WHO age and sex-specific growth charts, but no recommendations on their use and interpretation [170, 171, 175] or refers to WHO[d] and CDC[e] websites for further information [176]

[^] All documents included in the review are intended for use in the PHC settings *(the WHERE)* and to support optimal child health and growth *(the WHY)*
[a] Milk feeding: Breastfeeding or infant formula feeding
[b] Anthropometric measures: body measurements i.e. height, weight, length, head circumference, waist circumference
[c] Growth charts: Weight-for-age birth to 2 years (WHO) and 2 to 20 years (CDC) (Girls and Boys), length-for-age birth to 2 years (WHO) (Girls and Boys), head circumference-for-age birth to 2 years (WHO) (Girls and Boys), height-for-age percentiles 2 to 20 years (CDC) (Girls and Boys), body mass index-for-age 2-20 years (CDC) (Girls and Boys)
[d] https://www.who.int/tools/child-growth-standards
[e] https://www.cdc.gov/growthcharts/clinical_charts.htm

4.6.3 Health behaviour and growth promotion advice

All documents included health promotion advice for dietary intake and at least one other health behaviour domain. Nine documents included health promotion advice for all four health domains, including two national documents [97, 163], four documents from Queensland [167-169, 174], and one document from Western Australia [165], Northern Territory [171], and New South Wales [173]. Recommendations to provide health promotion advice for dietary intake was most common (n = 18), followed by sleep (n = 16), physical activity (n = 15) and sedentary behaviour (n = 10). Only ten documents included recommendations to discuss growth promotion advice with caregivers [55, 163-166, 168, 173-175, 177]. Recommendations as per the *5W + 1H Framework* are summarised below in Table 12.

4.6.3.1 Who

Within national and state/territory documents (n = 10), all health behaviour and growth promotion advice recommendations were targeted to practitioners. In contrast, health behaviour and growth promotion advice within practice level child health records were targeted to caregivers (n = 8).

4.6.3.2 What

Health promotion advice for dietary intake included promoting and supporting milk feeding (n = 17), introduction of solids (n = 16), promoting nutrition (n = 15), parenting practices (n = 5), and discussing allergy prevention (n = 5). Health promotion advice for physical activity included promoting physical activity and active play as per national guidelines (n = 11). For sedentary behaviour, health promotion advice included discussing screentime and quality of sedentary behaviour activities (n = 2), whilst for sleep, health promotion advice included discussing safe sleeping (n = 13), sleep settling (n = 8) and sleep routine (n = 7).

Growth promotion advice included discussing weight-based monitoring (n = 9) by discussing growth patterns and findings, as well as promoting a healthy BMI.

4.6.3.3 When

Documents recommended providing health promotion advice during child health checks (n = 12), opportunistically (n = 3), in line with immunisations (n = 2), or did not specify when to provide advice (n = 9).

Two documents recommended providing health promotion advice about dietary intake opportunistically [163, 169], whilst one document recommended providing health promotion advice about physical activity in line with immunisations in addition to during child health

checks [97]. Ten documents provided health promotion advice with no indication of when to provide it [55, 158, 163, 167-170, 172, 173, 177].

Discussing growth was commonly recommended to occur during child health checks (n = 7), opportunistically [163], in line with immunisations [163], or not specified (n = 3).

4.6.3.4 How

Most documents that included health promotion recommendations provided context or specific strategies on how to improve child health behaviours. For dietary intake, this included promoting healthy foods and beverages and limiting discretionary choices. For two documents, dietary advice was provided in the context of supporting oral health [163, 177]. For physical activity, sedentary behaviour and sleep, documents commonly included age-specific daily recommendations in line with national guidelines. Documents also included specific strategies to improve the quality of a child's physical activity and sedentary behaviours including encouraging supervised floor-based play [55, 97, 163, 167, 169, 170, 173-177], active games [170, 171, 175-177], and non-screen-based activities such as reading and puzzles [165, 167, 168, 173]. Health promotion strategies to improve child sleep included discussing sleep routines [163-166, 168, 172, 175, 177] and settling strategies [164, 166, 174, 177].

Strategies on how to discuss growth with caregivers was included in seven documents [55, 163, 165, 166, 168, 174, 177] and included discussing growth and BMI in the context of factors influencing growth including child health behaviours, genetics, and environmental factors. Two documents also highlighted the importance of using non-stigmatising language and avoiding terms such as *'obese'* when discussing weight-based outcomes [55, 165].

Table 12: Synthesis of health behaviour and growth promotion advice according to 5W + 1H Framework

Domain	Framework^	Sub-domain	Synthesis of health promotion advice/recommendations included in documents
Dietary intake	WHO	(n = 18)	Practitioners [55, 97, 158, 163-169] Caregivers [170-177]
	WHAT	Milk feeding (n = 17)	Promote breastfeeding [158, 163-168, 171, 172, 176] until 12mo and beyond [55, 97, 165, 169, 173-175, 177] in the context of safe sleeping [165, 177] Promote exclusive breastfeeding until 4-6 months [97, 163] or 6mo of age [55, 165, 175, 177] Support formula bottle feeding [168, 169, 171, 172, 175] if unable to or not breastfeeding [55, 173, 177] noting the importance of appropriate and safe preparation [165], and how toddler formulas[173], special formulas and changing infant formula is not recommended (unless recommended by your health professional) [177] Support cessation of formula and bottles [169, 173] past 12 months of age [173, 177] in the context of oral health [177] Discuss health outcomes associated with breastfeeding and risks associated with not breastfeeding, and potential health risks, impact on lactation and financial considerations associated with infant formula use [165]
		Introduction of solids	Promote the introduction of solids around 6 months [55, 97, 165-167, 171-175, 177] not before 4 months of age, with signs of readiness (i.e. good head and neck control) [165, 177]

		(n = 16)	Discuss introduction of iron-rich foods [55, 165, 169, 171, 173, 177] Discuss complimentary foods in addition to milk feeding [55, 97, 165, 171, 173, 175, 177] Discuss first foods [163, 167] and food in the first year of life [164, 176]
		Promote nutrition (n = 15)	Promote healthy eating and nutrition for the child [158, 164-166, 168, 169, 171, 173, 174, 176] and family [158, 164-166, 169, 173-175] as per the Australian Dietary Guidelines [55, 97, 165, 167, 173]
		Parenting Practices (n = 5)	Discuss role modelling for healthy nutrition including promoting positive mealtime environments [165, 169, 177] and reducing mealtime distractions [172, 173] Discuss responsive feeding i.e. taking hunger/fullness cues from children and not forcing to finish meals or drinks [165, 169, 173, 177] Promote healthy relationships with food including healthy family eating habits [169] Encourage self-feeding and transitioning to a cup from 6 months [165]
		Allergy prevention (n = 5)	Promote the introduction of allergenic foods [165, 172] by 12 months of age [169, 177] and should not be delayed [97]
	WHEN	(n = 18)	Opportunistically [163, 169]

			During Child Health Check/s [97, 164-166, 169-171, 173-176] Not specified [55, 158, 167, 168, 172, 173, 177]
	HOW	(n = 14)	Promote healthy drinks [97, 172, 174] including water [165, 170, 171, 173] and plain milk from 12 months and in the context of oral health [177] Recommend a healthy breakfast [170, 173], healthy food/snacks for school [170] or healthy meals and snacks in the context of oral health [177] Recommend a wide variety of foods [171, 173] from the 5 food groups [55, 97, 165, 167, 169, 172] in the context of oral health [177] Recommend 3 meals and 2 snacks per day [165, 171], small frequent and nutrient dense meals [165] Discuss limiting discretionary foods and/or drinks [55, 97, 164, 165, 167, 169, 171-173] and no tea and coffee [171] in the context of oral health [163, 177] Offer foods that are high in fibre (to support constipation) [165] Discuss importance of iron rich foods beyond 6 months [171] Discuss food safety including food storage/preparation [55, 167, 169], risk of choking [172, 177] and burns when reheating bottles or food [168, 169, 177]
	WHO	(n = 15)	Practitioners [55, 97, 158, 163, 165, 167-169]

Physical Activity			Caregivers [170, 171, 173-177]
	WHAT	Promote physical activity (n = 11)	Promote physical activity [158, 165, 168, 169, 174-176] and active play [165, 173-176] as per Australian recommendations [97]/Australian 24-hour Movement Guidelines for children aged 0-5 years [55, 165, 169]
	WHEN	(n = 15)	Opportunistically [163] During Child Health Check/s [97, 165, 170, 171, 173-177] In line with Immunisations [97] Not specified [55, 158, 163, 167-169, 173]
	HOW	(n = 14)	Encourage supervised floor-based play or tummy time [55, 97, 163, 167, 169, 170, 173-177] Encourage jumping, running, dancing, bike riding and other active games [170, 171, 175-177] Infants – Recommend 30 minutes of tummy time per day [165, 167, 173] Toddlers – Recommend 3 hours of physical activity per day [173] and spread throughout the day [55, 97, 163, 165, 167, 168] Pre-schoolers – Recommend should be physically active every day for at least 1 hour [173], 3 hours spread throughout the day [97, 163, 165, 167, 168] with at least 60 minutes of energetic play [165, 167]

Sedentary Behaviour	WHO	(n = 10)	Practitioners [55, 97, 163, 165, 167-169] Caregivers [171, 173, 174]
	WHAT	Sedentary behaviour (n = 2)	Discuss sedentary behaviour recommendations including screen time [169] and quality of sedentary behaviour activities as per Australian 24-hour Movement Guidelines [165]
	WHEN	(n = 10)	Opportunistically [163] During Child Health Check/s [97, 165, 171, 174] In line with Immunisations [97] Not specified [55, 163, 167-169, 173]
	HOW	(n = 9)	Encourage non-screen-based activities including reading, singing, puzzles or storytelling [165, 167, 168, 173] Spend less time sitting and more time playing and moving together [173] Children 0-5 years should not be sedentary, restrained, or kept inactive for >1 hour at a time i.e. in a car seat or in a stroller [55, 163, 165, 167, 168] 0-2 years – Recommend no sedentary screen time [55, 97, 163, 165, 167, 168, 171, 173, 174] other than video-chatting [165]

			2-5 years – Recommend limiting screen time to <1 hour/day [55, 97, 163, 165, 167, 171, 173, 174] and provide supervision [171]
Sleep	WHO	(n = 16)	Practitioners [97, 164-169] Caregivers [170-177]
	WHAT	Sleep safety (n = 13)	Discuss safe sleeping [165, 166, 170-177] and risk factors for Sudden Infant Death Syndrome [164, 165, 168, 172, 173, 175, 177]
		Sleep settling (n = 8)	Discuss sleep and settling [165, 166, 168, 169, 171, 172, 174, 177] and parental concerns [169]
		Sleep routine (n = 7)	Promote healthy [97], optimal [169] and sufficient sleep [165, 170, 171, 173] as per Australian 24-hour Movement Guidelines [165] Promote and develop calming and consistent bedtime routines [163]
	WHEN	(n = 16)	Opportunistically [163] During Child Health Check/s [97, 164-166, 170, 171, 173-177] Not specified [167-170, 172, 173, 177]
	HOW	(n = 10)	Discuss sleep cycles, routines, habits and naps [164-166, 168, 172, 175, 177]

			Discuss sleep settling strategies (i.e. controlled comforting, systematic ignoring, scheduled waking, gentle patting, swaddling) [164, 166, 174, 177] Infant (0 – 12 months) – Recommend 16-18 hours/day (Newborn) [168],14-17 hours/day (0-3 months old) [165, 167, 173], 14-15 hours/day (3 months old) [168], 14 hours/day (6-9 months old) [168], 12-16 hours/day (4-11 months old) [165, 167, 173], 12-14 hours/day (12 months old) [168] Toddler (1 – 3 years) – Recommend 11-14 hours/day (1-2 years) including naps, with consistent sleep and wake times [165, 167, 173], 11-14 hours/day (1-3 years old) transition from one nap to no naps per day [168] Child (3 - 5 years) – Recommend 10-13 hours/day [165, 167, 173] with gradual transition to no naps [168]
Growth	WHO	(n = 10)	Practitioners [55, 163-166, 168] Caregivers [173-175, 177]
	WHAT	Weight-based monitoring (n = 9)	Discuss growth patterns and findings [163, 165, 166, 173-175, 177], the use of growth charts [168, 177] and expected growth patterns, trajectories and percentiles as part of a holistic assessment for infant health and wellbeing [165] Promote a healthy BMI [164]
	WHEN	(n = 10)	Opportunistically [163] During Child Health Check/s [164-166, 173-175]

			In line with Immunisations [163] Not specified [55, 163, 168, 177]
	HOW	(n = 7)	Discuss growth and BMI [163, 165, 166, 174] in the context of factors influencing growth [168] including health behaviours[165, 166, 174] genetic, ethnic and environmental factors [165, 166, 177] and link to any intervention being undertaken [163] Conversations should focus on growth and health rather than discussing weight [165] and should avoid terms such as ‘obese’ [55] and should be free from stigma, blame and judgement [165]

[^] All documents included in the review are intended for use in the PHC settings *(the WHERE)* and to support optimal child health and growth *(the WHY)*

[a] Screen time includes the amount of time viewing television, computers, smartphones, tablets, and video consoles

4.7 Discussion

The purpose of this review was to identify and synthesise recommendations within current Australian documents that guide PHC practice for growth monitoring, health behaviour screening and health promotion advice in the early years (birth to five years). Growth monitoring was identified as a key responsibility for PHC and was recommended in all 18 documents. Recommendations to screen and promote child health behaviours was also identified in all 18 documents, however few documents included recommendations across all four health behaviour domains. Utilising the *5W + 1H Framework* to synthesise and contextualise guideline recommendations, our results demonstrate that compared to measuring growth, recommendations to screen and promote child health behaviours are fragmented and incomplete. Although guidelines recognise health promotion advice and screening as important responsibilities of PHC, comprehensive recommendations to support all four health behaviour domains is lacking and varies across Australian jurisdictions.

Growth monitoring was identified as a key responsibility in PHC and was recommended in all 18 documents in this review. In Australia, national guidelines for general practice and universal child and family health services recommend using growth charts published by the World Health Organisation (WHO) or Centers for Disease Control (CDC) [97, 158]. Growth charts are a traditional approach to monitoring child growth, health, and development, with anthropometry, including weight, being a well-recognised objective and clinical measure. It is therefore no surprise that growth monitoring was recommended within all guideline documents in this review, consistent with findings from Gooey and colleagues who explored international clinical practice guidelines [79]. Despite this, there is a lack of high-level evidence supporting the effectiveness of routine growth monitoring due to the considerable complexity in accurately measuring, plotting, and interpreting child growth, and communicating these findings sensitively and appropriately to caregivers [79, 100, 112, 115, 116, 180]. Growth charts do not consider ethnic or genetic characteristics and are a proxy measure of a child's health and their health behaviours. There is also the risk of anxiety, stigma and reluctance from both practitioners and caregivers to have weight-focussed conversations [98, 112, 114, 115, 118, 123, 181]. Only two documents within the review highlighted the importance of avoiding weight-focused conversations, however these documents lacked practical recommendations on how to have non-stigmatising conversations in practice [55, 165]. The sensitive nature of these conversations can impact rapport and engagement, and without appropriate guidance for practitioners on how to communicate growth monitoring observations in practice, caregivers may not understand what the measurements mean in the context of their child's overall health [182].

In additional to growth monitoring, documents identified in this review recommended screening for child health behaviours, however the recommendations were fragmented and incomplete, with only two documents providing recommendations across all four health behaviour domains [163, 165]. Screening for a child's dietary intake, physical activity, sedentary behaviour and sleep, provides an opportunity to comprehensively understand a child's health behaviours and provide individualised advice. This approach also has potential to address known barriers and limitations of growth monitoring, including impact on stigma and rapport, and be an acceptable and feasible approach in PHC [126, 183]. Interestingly, specific tools to support practitioners to comprehensively screen for child health behaviours were not included or recommended in guidelines. Two screening tools were identified in this review, however they only captured one health behaviour domain, sleep [163, 164, 184]. This highlights the need for the development or integration of a suitable screening tool that measures all child health behaviour domains in Australian PHC.

Providing health promotion advice was identified as another key responsibility of PHC in addition to growth monitoring and screening for child health behaviours. Health promotion advice included within documents reflect opportunities for PHC practitioners to support families to improve child health behaviours to meet evidence-based and age-specific guidelines. Similar to child health behaviour screening recommendations, documents in this review also lacked consistent and comprehensive health promotion advice across all four health behaviour domains. Furthermore, the recommendations were typically generic statements to promote or discuss a particular health behaviour, rather than strategies to provide tailored and individualised advice to caregivers. The *5As (ask, assess, advise, assist/agree, and arrange) Framework* is an internationally accepted framework for organising the assessment and management of modifiable risk factors and facilitating health behaviour change in PHC [97]. In line with this framework, practitioners should first engage in asking about or assessing a health behaviour, prior to providing advice. Tailored health promotion advice that considers the families social and cultural context is also more likely to be acceptable and practical for caregivers, compared to generic health promotion information [70]. Due to their interrelated and collective importance, revised guidelines need to recognise the importance of health promotion across all four health behaviour domains and include practical advice and strategies for practitioners to suggest in practice [164].

The context in which health behaviour screening and promotion occurs is important. This includes who is responsible, and where and when these preventive activities occur. Recommendations within the included documents in this review were either targeted at the caregiver as a pre-consult screening question or targeted at the PHC practitioner to discuss

during the consult. Recommendations on when to screen or promote child health behaviours also varied across documents, including opportunistically, annually, at the practitioner's discretion (i.e. not specified), during routine child health checks or in line with immunisation appointments. Child health checks are conducted at regular touch points within the first five years of life and were the most recommended time to screen and promote child health behaviours. This demonstrates a prime opportunity to incorporate child health behaviour screening into routine practice at these well-established touchpoints. However, to support uptake, implementation, effectiveness, and sustainability in practice, accompanying resources are required [126, 183]. This includes practitioner and caregiver resources, practitioner education, additional consultation time, referral pathways, and practitioner incentives [79, 117, 185]. Understanding the context is important for informing screening tool design as well as the resources and supports required to implement, embed, and sustain health behaviour screening in practice. Meaningful engagement and partnerships with a range of PHC practitioners is required to develop and integrate fit-for-purpose screening tools and accompanying resources into routine PHC practice [79, 126, 183].

4.7.1 Strengths and considerations

Strengths of this review include a rigorous and comprehensive search strategy to capture documents relevant for child health behaviours in the early years. This provided a thorough understanding of the national and state/territory context for PHC practice in the early years. The inclusion of child health records from every Australian jurisdiction also provides a unique insight into the documents that guide consults between caregivers and maternal, child and family health nurses in practice. Utilising a content analysis supported by the *5W + 1H Framework* to describe and synthesise recommendations is another key strength of this review as it aligns with the context in which information is communicated to PHC practitioners. Due to the scope of this review and the variety of included documents, the quality of documents was not examined using a critical appraisal checklist. Lastly, most of the screening and extraction was done by one reviewer, however the synthesis and interpretation of results was confirmed with the wider review team.

4.7.2 Implications for future research, policy, and practice

Findings from this review provide tangible implications to improve current recommended practice for preventive care in the early years. Child health behaviour screening aligns with national policy priorities and with recommendations within current guidelines. Guidelines are a key implementation mechanism to translate policy priorities and recommendations into practice [186, 187]. Our findings signal an opportunity to revise PHC guidelines to include child health behaviour screening and promotion advice across all four health behaviour

domains to better support practitioners to provide consistent preventive care across all Australian jurisdictions. Practical screening tools for measuring child health behaviours would enable practitioners and caregivers to initiate and engage in individualised and culturally appropriate health behaviour focused conversations and monitor children's health behaviours overtime, at both an individual and population level. Child health behaviour screening tools exist internationally [126, 183], however there is limited literature exploring the effectiveness of screening and currently available screening tools have not been tested in Australian PHC settings. Future research is required to explore Australian PHC practitioner and caregiver perspectives on child health behaviour screening including the feasibility and acceptability of this approach. Furthermore, the perspectives of culturally and linguistically diverse families should be explored. The effectiveness of child health behaviour screening should also be examined, including the impact on short- and longer-term child health outcomes, as well as the implementation strategies and resources required to embed screening into PHC practice. Child health behaviour screening also has potential as a screening approach in other early years settings and sectors including early education and care, and community services.

4.8 Conclusion

Screening and promoting children's health behaviours and growth are key preventive responsibilities for Primary Health Care (PHC), and are recommended within national, state/territory, and practice level guiding documents. Current practice in Australia for monitoring and promoting children's health behaviours is reliant on PHC practitioners initiating health behaviour conversations informed by growth monitoring charts. There is a need to develop and incorporate evidence-based, practical screening tools into PHC guidelines, policy, and practice resources to support PHC practitioners to monitor and promote child health behaviours in the early years consistently and appropriately. Screening for child health behaviours could inform tailored advice and reduce weight-focussed conversations, which are known to be stigmatising and impact rapport between caregivers and PHC practitioners. By embedding child health behaviour screening tools into routine child health and development checks, PHC practitioners can better support childhood growth, health, and development in the early years.

4.9 Chapter Summary

This chapter reports the outcomes of a review of Australian documents that guide Primary Health Care (PHC) practitioners to support optimal growth, health, and development of children in the early years. The findings suggest that screening and promoting children's health behaviours is recommended within national, state/territory, and practice level documents, however the consistency and comprehensiveness of recommendations within the documents is varied. Furthermore, this indicates the need to embed practical screening tools to better support the monitoring and promotion of child health behaviours in PHC. The next chapter reports the results of a systematic review exploring the effectiveness, acceptability, and feasibility of existing child health behaviour screening tools that have been tested in PHC internationally.

5 SCREENING TOOLS USED IN PRIMARY HEALTH CARE SETTINGS TO IDENTIFY HEALTH BEHAVIOURS IN CHILDREN (BIRTH-16 YEARS); A SYSTEMATIC REVIEW OF THEIR EFFECTIVENESS, FEASIBILITY AND ACCEPTABILITY

5.1 Chapter Overview

This chapter addresses Objective 2 of the thesis and presents the results of Study 2, a systematic review of existing screening tools to measure children's health behaviours in Primary Health Care (PHC). A lack of Australian literature exploring this concept is identified as a key gap in the literature. A broader age range (birth to 16 years) was captured to understand the broader existing literature to identify if there was an existing tool that could be adapted for testing in an Australian PHC context.

Relevant Thesis Objective: Identify and describe the effectiveness, acceptability, and feasibility of child health behaviour screening tools used in PHC settings (Objective 2)

A version of this chapter has been published in peer-reviewed journal Obesity Reviews [183] (Appendix 5). The chapter and publication work were conceptualised and led by the PhD candidate, contributing 90% of the work (See co-author approvals in Appendix 1).

Citation: Dutch D, Bell L, Zarnowiecki D, et al. Screening tools used in primary health care settings to identify health behaviours in children (birth–16 years); A systematic review of their effectiveness, feasibility and acceptability. *Obesity Reviews*. 2024; 25(4): e13694. https://doi.org/10.1111/obr.13694

Co-author contributions: Rebecca K. Golley (RKG), Dorota Zarnowiecki (DZ), Kamila Davidson (KD), Elizabeth Denney-Wilson (EDW), Brittany J. Johnson (BJJ) and Lucinda Bell (LB) conceived the project and provided study oversight. With the assistance of a research librarian, DZ developed the search strategy and Dimity Dutch (DD) conducted the search. DD, Heilok Cheng (HC), Rebecca Byrne (RB), Chris Rossiter (CR), DZ, KD and Alexandra Manson (AM) carried out article screening, DD conducted data extraction, and DD and Eve House (EH) completed critical appraisal. DD, HC, EH, BJJ, LB and AM drafted the manuscript, and all authors contributed to the interpretation of results and critical review of the manuscript. All authors read and approved the final manuscript.

5.2 Abstract

Background: Child health behaviour screening tools have potential to enhance the effectiveness of early intervention and health promotion. This systematic review aimed to examine the effectiveness, acceptability, and feasibility of child health behaviour screening tools used in Primary Health Care (PHC) settings.

Methods: A systematic review of studies published in English in five databases (CINAHL, Medline, Scopus, PsycINFO and Web of Science) prior to July 2022 was undertaken. Eligible studies described: 1) screening tools for health behaviours (dietary, physical activity, sedentary or sleep-related behaviours) used in PHC settings in children birth to 16 years; 2) tool effectiveness for identifying child health behaviours and changing practitioner behaviour; 3) tool acceptability or feasibility from child, caregiver or practitioner perspective and/or 4) implementation of the screening tool.

Results: Of the 7145 papers identified, 22 studies describing 14 screening tools were included. Only four screening tools measured all four behaviour domains. Fourteen studies reported changes in practitioner self-reported behaviour, knowledge, and practice. Practitioners and caregivers identified numerous benefits and challenges to screening.

Conclusions: Health behaviour screening can be an acceptable and feasible strategy to assess children's health behaviours in PHC. Further evaluation is needed to determine effectiveness on child health outcomes.

Keywords: children, health behaviour, primary health care, screeners

5.3 Introduction

Dietary intake, physical activity, sedentary behaviour, and sleep habits are key modifiable health behaviours contributing to substantial health and economic burden globally. Over one-third (38%) of total chronic disease burden is potentially avoidable because of modifiable risk factors [36, 37]. Health behaviours are established during childhood and adolescence and can influence health across the life course [24, 32-34, 42]. Therefore, monitoring and supporting health behaviours in the early years is critical to support lifelong health [38, 39].

Primary Health Care (PHC) is defined by the World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF) as being *"a whole-of-society approach to health that aims at ensuring the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment"* [19]. PHC is often the first point of contact to the health care system for families of young children and is therefore an opportunistic and important setting for promotion of, and early intervention for positive health behaviours in childhood and adolescence. PHC is a trusted, valued and accessible setting for children and their families, with key responsibilities in screening for disease risk factors and providing counselling for families [72, 74, 91]. Current recommended practice within PHC is to identify children with or at risk of inadequate or excess growth, as a proxy for poor health behaviours, based on growth monitoring, with or without brief advice for health behaviours [95, 97-99]. However, several international systematic reviews have found a lack of high-level evidence to support the effectiveness of routine growth monitoring as a screening tool in practice, and its benefit on child health [100, 108, 110]. Further, practitioners have difficulty plotting and interpreting growth charts to inform practice, resulting in potentially inappropriate or ill-informed advice [116] while caregivers are often not receptive to weight-focussed conversations [114, 123, 124]. Growth monitoring also provides little guidance on what health behaviours the child and family might require support with. Given these limitations with current growth monitoring practice, there is opportunity to utilise measures of diet quality, physical activity, sedentary behaviours and sleep habits as modifiable health behaviours that influence child growth and key risk factors for non-communicable disease in later life. Health behaviour screening would allow PHC practitioners to better understand a child's unique health behaviours and provide tailored advice to families.

‘Gold standard’ methods of measuring health behaviours such as accelerometry and diet histories can be time consuming and are therefore not feasible in time poor settings such as PHC [188, 189]. Brief screening tools can be a time-efficient and cost-effective method of assessing health behaviours, allowing for identification of specific target behaviours to inform individualised counselling and intervention. Incorporation of screening for health behaviours into PHC practice provides greater insight into child health, beyond weight status, compared with current growth monitoring practice. The interrelated nature of health behaviours means it is important to identify and manage behaviours as they exist collectively, rather than in isolation [56, 190-192]. Thus, brief screening tools that comprehensively measure all four health behaviour domains in children, pose an effective strategy to support long-term population health and a more cost-effective and sustainable PHC system.

A systematic review by Byrne and colleagues identified and described the validity and reliability of 12 brief screening tools to measure health behaviours in children in the first 5 years of life [125]. However, none of the included screening tools measured all four health behaviour domains, and few were used or evaluated in PHC settings. Thus, their suitability for application in this setting is unknown. Further tools were identified in a systematic review by Krijger and colleagues, which described 41 unique screening tools to measure health behaviours in children aged 0–18 years in community settings [126]. However, the tools described in this review ranged in length, with several tools >25 items in length, impacting their suitability for use in the time poor PHC setting. Additionally, these reviews did not address post-screening actions (i.e., counselling or referral pathways) essential for enabling positive behaviour change; caregiver or practitioner acceptability and feasibility; or the effectiveness of child health behaviour screening on practitioner behaviour, knowledge, or practice in PHC settings, which is required to understand if health behaviour screening is suitable for widespread adoption. A gap also exists in knowledge regarding the implementation strategies, and the tools and resources required to embed health behaviour screening into routine PHC practice.

5.4 Aim & Objectives

Aim: To identify and describe screening tools used in Primary Health Care (PHC) settings that measure health behaviours in children from birth to 16 years.

Objectives:

1. Determine their effectiveness in identifying child health behaviours and changing practitioner knowledge, attitudes, and/or practice.
2. Understand practitioners', caregivers' and children's views of health behaviour screening tools.
3. Describe the training and resources required to support implementation of health behaviour screening within PHC practice.

5.5 Methods

This systematic review followed a prospectively prepared protocol (PROSPERO International prospective register of systematic reviews: registration number: CRD42022340339 https://www.crd.york.ac.uk/prospero/) and is reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for systematic reviews (Appendix 4) [148].

5.5.1 Search strategy and information sources

A comprehensive and systematic search of five electronic databases (CINAHL, Medline, Scopus, PsycINFO, Web of Science) was undertaken in July 2022 to identify screening tools used with children and/or caregivers in a Primary Health Care (PHC) setting for the identification of health behaviours (i.e., diet, physical activity, sedentary behaviour, and sleep). Search terms were pilot tested, refined and tailored to each database in consultation with an academic librarian. Keywords and subject headings were organised into three categories: (i) population (e.g., infant, toddler, preschool, child, youth, adolescent, paediatric) AND (ii) context (e.g., primary health care, family practice, general practitioner, health professional) AND (iii) concept (e.g., screen/screener/screening, questionnaire, survey checklist, detect, identify, diagnosis, decision support systems, decision making). No publication date limits were applied. An overview of the full search strategy used in MEDLINE is presented in Figure 4.

Ovid®

Database(s): **Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R)** 1946 to November 20, 2020

Search Strategy:

#	Searches	Results
1	primary health care/	78919
2	(primary care or primary medical care).tw.	116915
3	(primary health or primary healthcare).tw.	30594
4	general practice.tw.	35628
5	family practice/	65326
6	(family practice or family medicine*).tw.	17375
7	(general practitioner* or gp* or general physician*).tw.	221327
8	(health* adj4 (provider* or personnel or worker* or profession*)).tw,kw.	247111
9	(family physician* or family doctor* or family practitioner*).tw.	20772
10	Health Personnel/	44900
11	physicians, family/	16450
12	or/1-11	680821
13	community health services/	31873
14	(communit* adj3 health).tw.	51046
15	13 or 14	77702
16	12 or 15	736751
17	exp Infant/ or exp Child/ or exp Child, Preschool/ or exp Pediatrics/ or exp Adolescent/	3615496
18	(Child* or youth* or infant* or toddler* or "pre-school*" or infanc* or Adolescen* or teen* or Paediatric* or pediatric*).tw,kw.	2102291
19	17 or 18	4152544
20	exp Obesity/ or exp Pediatric Obesity/	216992
21	(Obes* or over*weight or overweight or adipos* or "body fat*").tw,kw.	417605
22	20 or 21	458178
23	19 and 22	104471
24	Mass Screening/	104946
25	"Surveys and Questionnaires"/	475182
26	Qualitative Research/	58238
27	Psychometrics/	76520
28	"Diagnostic Techniques and Procedures"/	3368
29	Decision Support Systems, Clinical/ or Decision Trees/ or Clinical Decision Rules/ or Clinical Decision-Making/ or Decision Making, Computer-Assisted/ or Decision Support Techniques/	50443
30	(tool adj2 (screen* or test* or diagnos* or identi* or deci* or detect* or recog*)).kw,tw.	75722
31	(test adj2 (screen* or tool* or diagnos* or identi* or deci* or detect* or recog*)).kw,tw.	72928
32	(screen* adj4 (checklist or detect* or instrument* or index* or tool* or diagnos* or identi* or recog*)).kw,tw.	120009
33	(qualitative or "qualitative research").tw,kw.	239390
34	(checklist or detect* or instrument* or index or screen* or test* or diagnos* or identi* or deci* or detect* or recog*).kw,tw.	10676173
35	(earl* adj2 (detect* or ident* or screen* or diag* or recog*)).tw,kw.	246764
36	24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 35	1315629
37	36 and 23 and 16	1231

Figure 4: Overview of Systematic Review MEDLINE Search

5.5.2 Eligibility criteria

5.5.2.1 Types of studies

Included studies reported on empirical research, including randomised controlled trials, experimental studies, non-randomised comparison studies, pre-post designs, and qualitative research. Reviews, commentaries and letters to the editors, as well as dissertations and conference abstracts, were excluded.

5.5.2.2 Participants

Eligible participants included children aged ≤16 years of age and their caregivers, and PHC practitioners (e.g., practice managers, general practitioners, nurses). Studies that included children over 16 years of age were eligible provided the mean age was ≤16 years of age. This child age range was chosen as a child aged 16 years and older can consent to their own medical treatment [193]. For this review, caregiver is used to describe parents and other primary caregivers.

5.5.2.3 Concept

The concept of interest was screening tools (including decision support tools, diagnostic tools) for at least one child health behaviour or caregiving practices relating to diet, physical activity, sedentary behaviour, and sleep, such as rules and routines regarding family meals and screen use. There was no specific exclusion criterion for number of tool items; however, because of the nature of the PHC setting, it was assumed all tools would be brief. Studies could examine the screening implementation approach, metrics of use, participant views including acceptability, attitudes, or effectiveness in identifying child health behaviours or changes in practitioner screening behaviour. Screening tools could be delivered via any mode (e.g., paper or online) and be completed by any of the above participant groups (i.e., children, caregivers, practitioners). Studies were excluded if the screening tool focused solely on physical examination or diagnosis, assessed behavioural outcomes of weight loss interventions or the study used the screening tool to assess study eligibility only.

5.5.2.4 Context

Eligible studies were undertaken in any PHC setting internationally, including general practice, maternal and child health services, community health or indigenous health services. Studies where the screening tool was used by specialists or services where children are referred for assessment or treatment of overweight were excluded.

5.5.3 Selection process

Study selection was undertaken using the web-based systematic review software Covidence [194] by DD, HC, RB, CR, DZ, KD and AM. Studies were screened in duplicate against the a priori defined inclusion and exclusion criteria in two stages: (1) title and abstract screening and (2) full text screening of remaining articles. Any discrepancies were resolved by discussion. Reference lists of included articles and relevant reviews were also hand-searched to identify any additional relevant studies, which were subsequently checked for eligibility against the inclusion and exclusion.

5.5.4 Data extraction and risk of bias assessment

Data extraction was performed by one reviewer (DD) using a standardised review-specific data extraction table that had been piloted with selected studies prior and refinements made to ensure consistency in the extraction process across studies. Following data extraction of the first 10% of included papers by two reviewers (DD and Research Assistant), further amendments were made.

Data extracted included: author, year, study title; study details (study design, duration, setting); population characteristics (number of participants, child age, PHC practitioner role, number of PHC centres); screening tool characteristics (name, number of items, health behaviours addressed, administration method, any reported testing for validity and reliability); changes in practitioner behaviour; PHC practitioner views on screening tools; caregiver views on screening tools; and practitioner-identified training and resource needs. If the eligible screening tool was not available, corresponding authors were contacted via email to seek a copy for data extraction purposes.

Risk of bias assessment was undertaken with the Mixed Methods Appraisal Tool (MMAT) [195] by two reviewers (DD and EH), which assesses study quality on five domains for five empirical study designs: (1) Qualitative, (2) Quantitative randomised controlled trials, (3) Quantitative non-randomised, (4) Quantitative descriptive, and (5) Mixed methods.

5.5.5 Data synthesis

A narrative synthesis approach was used in this review because of the range of different study designs (including qualitative and mixed methods studies), research questions and outcome measures reported in the included studies. The narrative synthesis of findings was structured to address the primary and secondary aims. Synthesis was organised into five key components: 1)

description of available screening tools; 2) effectiveness of screening tools for identifying child health behaviours and changing PHC practitioner knowledge, attitudes, and practice; 3) acceptability and feasibility of tools for a) PHC practitioners and b) caregivers and children; 4) training and resources required for implementation of screening tools.

5.6 Results

5.6.1 Search results and characteristics of included studies

Database searching identified 7145 unique records of which 19 met the review criteria (Figure 5). An additional three eligible studies were identified through citation pearling. The final 22 studies included in this review were undertaken in the United States (US) (n = 17), Canada (n = 4) and the United Kingdom (UK) (n = 1) (Table 13). Studies were predominately non-controlled interventions or quality improvement projects [196-204], ranging in duration from 6 weeks [202, 205] to 3 years [206]. The number of Primary Health Care (PHC) clinics included in each study varied from one [200, 206-208] to 20 clinics [198]. PHC practitioners included nurses, dietitians, physicians, and paediatricians, as well as clinic staff, such as clerks and managers. Children included in the studies ranged in age from 0–6 months [209] up to 18 years (e.g., 2–18 years), with only three studies including children aged <24 months [209-211] and most studies including children >2 years of age (n = 17).

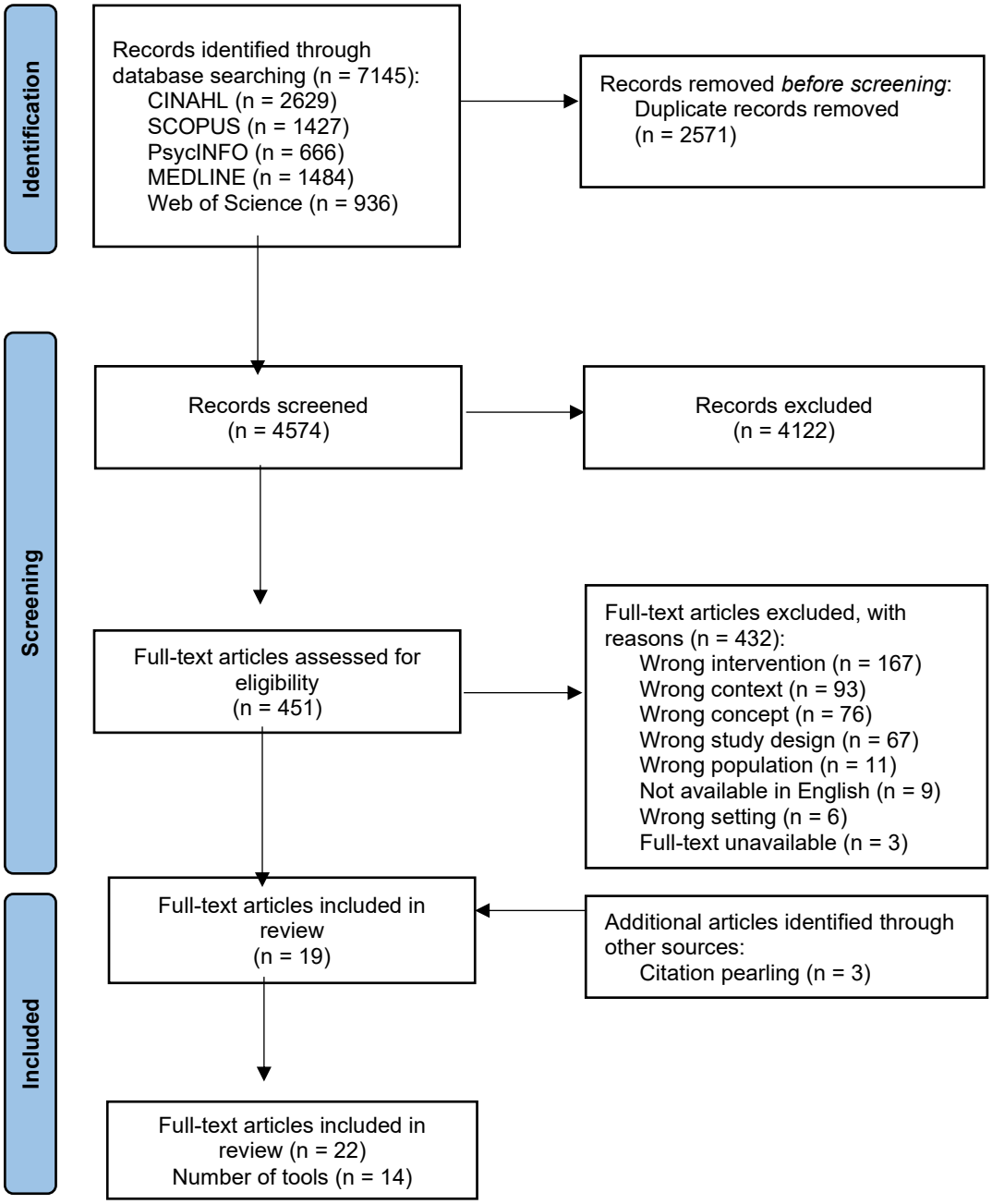


Figure 5: Systematic Review PRISMA Flow Chart

Table 13: Summary of studies describing a child health behaviour screening tool tested in PHC

Study details *First author (Year)* *Country*	**Intervention details** *Study design* *Intervention period/Study length*	**Child + Caregiver Population** *Child age*[a] *Child sample size*	**PHC Practitioner Population** *Practitioner sample size* *Number of PHC clinics*	**MMAT Score [195]** *Out of 100%*
Beno (2005) [196] United States	Intervention with follow up qualitative questionnaire and focus groups 6-months	Child age N/R	Practitioners n = 76 PHC Clinics n = 9	20%
Hinchman (2005) [197] United States	Delayed-control design 6-months	Children 5-18 years Children n = 660	Practitioners n=101 PHC Clinics n = 9	40%
Dunlop (2007) [212] United States	Medical Record Abstraction 6-months	Children 2-17 years Children n = 1348	Practitioners n = 38 PHC Clinics n = 6	80%
Woolford (2009) [213] United States	Mixed Methods 12-months	Children 2-5 years	Practitioners n = 15 PHC Clinics N/R	20%

McKee (2010) [210] United States	Qualitative evaluation of pilot intervention Intervention period N/R	Children 22-59 months Caregiver n = 18	PHC Clinics = 3	60%
Watson-Jarvis (2011a) [214] Canada	Descriptive cross-sectional survey 5-months	Child age N/R Caregiver n = 412	Practitioners n = 26 PHC Clinics n = 2	20%
Watson-Jarvis (2011b) [215] Canada	Descriptive cross-sectional survey 5-months	Children 3-≥6 years Caregiver n = 438	PHC Clinics n = 2	60%
Andrade (2020) [211] Canada	Mixed Methods 12-months	Children <17-72 months Children n = 280	Practitioners n = 5 PHC Clinics n = 5	40%
Christison (2014) [207] United States	Prospective, non-randomized, observational study 14-weeks	Children 4-16 years Children n = 100	Practitioners n = 7 PHC Clinics n = 1	20%
Herbenick (2018) [208] United States	Evidence-based practice design 10-weeks	Children 4-11 years Children n = 27	PHC Clinics n = 1	20%

Bailey-Davis (2019) [198] United States	Quasi Experimental 12-months	Children 2-9 years Children n = 10,647	PHC Clinics n = 20	40%
Gance-Cleveland (2014) [216] United States	Study design N/R 8-months	Child age N/R Children n = 3,215	Practitioners n = 14 PHC Clinics n=12	20%
Park (2015) [199] United Kingdom	Uncontrolled pilot intervention study with questionnaire and semi-structured interviews 6-months	Children 5-18 years Child mean age 10.7±2.6 years Children n = 14 Caregiver n = 12	Practitioners n = 4 PHC Clinics n = 4	20%
Sharpe (2016) [200] United States	Quality improvement study 6-months	Children 3-16 years Children n = 41 Caregiver n = 41	PHC Clinics n=1	20%
Polacsek (2009) [201] United States	Quasi experimental 18-months	Children 5-18 years 5-11years = 56%	Practitioners n=31 PHC Clinics n=19	20%

		12-17 years = 44% Children n=600 Caregiver n=539		
Gibson (2016) [217] United States	Retrospective and postintervention chart reviews 6-weeks	Preintervention child mean age 13.1±3.8 years Children n = 134	PHC Clinics n=2	60%
Camp (2017) [203] United States	Mixed Methods 8-weeks	Children 2-9 years Children n = 601	Practitioners n = 12 PHC Clinics n = 2	20%
Camp (2020) [205] United States	Mixed Methods 6-weeks	Children 2-9 years Children n = 425	Practitioners n = 12 PHC Clinics n = 2	20%
Karacabeyli (2020) [204] Canada	Preintervention and postintervention observational mixed methods 9 months (Community A) 12 months (Community B)	Children age N/R	Practitioners n = 21 PHC Clinics n = 6	20%

Savage (2018) [209] United States	Protocol for a Randomised Controlled Trial 7-months	Children 0-6 months Sample size aim: n = 290 mother-infant dyads	PHC Clinics N/R	20%
Shook (2018) [206] United States	Cross-sectional review of electronic medical records 3-years	Children 2-18 years Children n = 24,255	PHC Clinics n = 1	80%
Williams (2020) [218] United States	Mixed Methods 10-months	Children 3-17 years	Practitioners n = 44 PHC Clinics n = 2	20%

Abbreviations: MMAT: Mixed Methods Assessment Tool[195], MMAT scored out of 100%, 20% per question, higher % score indicating higher quality study; N/R: Not reported

[a]Child age as reported in the study

5.6.2 Risk of bias assessment of included studies

Risk of bias assessment was conducted using the Mixed Methods Appraisal Tool (MMAT) [195] and presented in Table 14. Overall, MMAT scores were mixed, with 14 studies reporting low risk of bias in one of five domains, receiving a score of 20%. Only two studies [206, 212] reported low risk of bias in four of five domains (score of 80%). None received a score of 100% (low risk of bias in all five domains).

Table 14: Critical appraisal of studies using the Mixed Methods Appraisal Tool (MMAT) [195]

Study	**S1**	**S2**	**Qualitative Studies**					**Randomised Controlled Trials**					**Non-randomised Studies**					**Quantitative Descriptive Studies**					**Mixed Methods Studies**					**Final Score**
First author (Year) *Country* *Study Design*			*1.1*	*1.2*	*1.3*	*1.4*	*1.5*	*2.1*	*2.2*	*2.3*	*2.4*	*2.5*	*3.1*	*3.2*	*3.3*	*3.4*	*3.5*	*4.1*	*4.2*	*4.3*	*4.4*	*4.5*	*5.1*	*5.2*	*5.3*	*5.4*	*5.5*	*Out of 100%*
Beno (2005) [196] United States Qualitative + Quantitative Descriptive	Y	Y	Y	UC	UC	N	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	N	UC	UC	UC	N/A	N/A	N/A	N/A	N/A	20%
Hinchman (2005) [197] United States Non-randomised study	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	UC	Y	Y	UC	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40%
Dunlop (2007) [212] United States Quantitative Descriptive	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	UC	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	80%
Woolford (2009) [213] United States Mixed Methods	Y	Y	Y	UC	UC	UC	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	N	Y	UC	Y	Y	N	N	N	UC	20%

McKee (2010) [210] United States Qualitative	Y	Y	Y	Y	UC	Y	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	60%
Watson-Jarvis (2011a) [214] Canada Quantitative Descriptive	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	UC	UC	N	UC	N/A	N/A	N/A	N/A	N/A	20%
Watson-Jarvis (2011b) [215] Canada Quantitative Descriptive	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	N	Y	N	Y	N/A	N/A	N/A	N/A	N/A	60%
Andrade (2020) [211] Canada Mixed Method	Y	Y	Y	UC	UC	Y	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	N	UC	UC	Y	Y	Y	UC	UC	UC	40%
Christison (2014) [207] United States Non-randomised Study	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N	N	UC	UC	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20%
Herbenick (2018) [208] United States Quantitative Descriptive	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	UC	UC	N	N	N/A	N/A	N/A	N/A	N/A	20%
Bailey-Davis (2019) [198] United States Non-randomised Study	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	UC	Y	N	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	40%

Gance-Cleveland (2014) [216] United States Non-randomised Study	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	UC	Y	UC	UC	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20%
Park (2015) [199] United Kingdom Mixed Methods	Y	Y	Y	Y	UC	UC	UC	N/A	N/A	N/A	N/A	N/A	N	UC	UC	Y	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20%
Sharpe (2016) [200] United States Non-randomised Study	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	UC	UC	N	UC	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20%
Polacsek (2009) [201] United States Non-randomised study	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	UC	UC	Y	N	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20%
Gibson (2016) [217] United States Quantitative Descriptive	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	Y	UC	UC	Y	N/A	N/A	N/A	N/A	N/A	60%
Camp (2017) [203] United States Mixed Methods	Y	Y	Y	UC	UC	N	UC	N/A	N/A	N/A	N/A	N/A	Y	UC	Y	N	UC	N/A	N/A	N/A	N/A	N/A	N	N	UC	UC	UC	20%
Camp (2020) [205] United States Mixed Methods	Y	Y	Y	UC	UC	UC	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	UC	UC	Y	Y	N	N	UC	UC	UC	20%

Karacabeyli (2020) [204] Canada Mixed Methods	Y	Y	Y	Y	UC	Y	UC	N/A	N/A	N/A	N/A	N/A	UC	UC	UC	UC	UC	N/A	N/A	N/A	N/A	N/A	Y	U/C	U/C	N	N	20%
Savage (2018) [209] United States Randomised Controlled Trial Protocol	Y	Y	N/A	N/A	N/A	N/A	N/A	UC	UC	UC	UC	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20%
Shook (2018) [206] United States Quantitative Descriptive	Y	Y	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	N	Y	Y	Y	N/A	N/A	N/A	N/A	N/A	80%
Williams (2020) [218] United States Mixed Methods	Y	Y	Y	UC	UC	Y	UC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Y	N	UC	Y	Y	Y	N	UC	UC	UC	20%
Abbreviations: Y: Yes, N: No, N/A: Not applicable, UC: Unclear MMAT, Mixed Methods Assessment Tool [195], MMAT scored out of 100%, 20% per question, higher % score indicating higher quality study																												

5.6.3 Characteristics of screening tools

Fourteen unique screening tools were identified across the 22 studies (Table 15). Four screening tools were not available in publication data — corresponding authors were contacted, of whom two responded to provide two screening tools as part of data extraction and synthesis: 5-2-1-0 Healthy Habits Survey [201] and The Family Lifestyle Assessment of Initial Risk (FLAIR) [210]. Tools ranged in length from 5 [206] to 22 items [196, 197, 212, 213] and were completed by patients (caregiver, or caregiver and child), practitioners, or both, using various administration methods (paper, online or computer, electronic medical record-based), timing (during or, prior to, consultation), and locations (home, waiting room, appointment room). Four tools addressed all four health behaviour domains: Computer-Assisted Treatment of CHildhood overweight (CATCH) [199]; Early Healthy Lifestyles (EHL) [209]; Healthy Habits Questionnaire (HHQ) [202, 203, 205]; Live 5–2–1-0 HHQ [204]. Most tools (n = 9) addressed the three health behaviour domains of diet, physical activity, and sedentary behaviour. One tool [211, 214, 215] addressed only two health behaviour domains, diet, and sedentary behaviour. In addition to the health behaviours of interest in this review, four tools addressed anthropometry (height, weight, BMI, or BMI category) and nine measured caregiving practices or their perspectives related to their child's health behaviours. The Family Nutrition and Physical Activity (FNPA) risk assessment tool and the Nutrition Screening Tool for Every Preschooler (NutriSTEP) questionnaire have been tested for both validity and reliability [219-221] and the Starting the Conversation 4-12 tool (STC 4-12) has been tested only for reliability [222].

Table 15: Characteristics of health behaviour screening tools identified for children in PHC settings

Tool name	**Tool features**		**Tool Questions/Content**						**Administration methods**				**Tested for[b]**	
Tool name (Reference studies)	*No of items*	*Scale used / Scoring system*	*Diet*	*PA*	*SB*	*Sleep*	*Anthro*	*Caregiver practices / perspectives*	*Mode*	*Timing*	*Location*	*Completed by*	*Validity*	*Reliability*
Assessment and Targeted Messages (ATM) tool Woolford (2009) [213]	22	Yes/No questions 10-point Likert scale (not ready to very ready)	✓	✓	✓		✓ BMI category	✓	N/R	During	Appointment room	Caregiver + Practitioner	N/R	N/R
Computer-Assisted Treatment of Childhood Overweight (CATCH) Park (2015) [199]	16	Yes/No questions Frequency	✓	✓	✓	✓	✓	✓	Online	During	Appointment room	Caregiver + Practitioner	N/R	N/R
Early Healthy Lifestyles (EHL) risk assessment tool[a] Savage (2018) [209]	N/R	N/R	✓	✓	✓	✓		✓	Online *(integrated into electronic medical record)*	Prior	Waiting room	Caregiver	N/R	N/R

Lifestyle Assessment Questionnaire Shook (2018) [206]	5	Likert scale 5-10 response options (vary per question)	✓	✓	✓				Online	Prior	Waiting room	Caregiver	N/R	N/R
Family Nutrition and Physical Activity (FNPA) risk assessment tool Christison (2014) [207] Herbenick (2018) [208] Bailey-Davis (2019) [198]	20	4-point Likert scale (almost never - almost always)	✓	✓		✓		✓	N/R	During	N/R	Caregiver OR Child	✓[219, 220]	✓[219]
									N/R	Prior	N/R	Caregiver		
									Online	Prior	Waiting room (85%) Home (15%)	Caregiver		
HeartSmartKids (HSK)[a] Gance-Cleveland (2014) [216]	N/R	N/R	✓	✓	✓		✓ Height, Weight + BMI		Online	N/R	N/R	Caregiver + Child	N/R	N/R
5-2-1-0 Healthy Habits Survey (2 versions: 2-9 years and 10 and older)	10	Yes/No questions Continuous numeric values	✓	✓	✓				Paper	Prior	Waiting room	Caregiver OR child	N/R	N/R

Polacsek (2009) [201]		Identification of a caregiver priority behaviour												
Healthy Habits Questionnaire Gibson (2016) [217] Camp (2017) [203] Camp (2020) [205]	10	Yes/No questions Continuous numeric values Identification of a caregiver priority behaviour	✓	✓	✓	✓		✓	N/R	Prior	Waiting Room	Caregiver (2-9yo) OR Child (10-18yo)	N/R	N/R
									Paper	Prior	Waiting Room	Caregiver		
									Paper *(then entered into electronic medical record)*	Prior	Waiting Room	Caregiver		
Live 5210 Healthy Habits Questionnaire Karacabeyli (2020) [204]	20	Yes/No questions 3-4-point Likert scale questions Identification of a caregiver priority behaviour	✓	✓	✓	✓		✓	N/R	Prior	Waiting Room	Caregiver (2-9yo) OR Child (10-18yo)	N/R	N/R

Nutrition and Activity Self History (NASH) Form Beno (2005) [196] Hinchman (2005) [197] Dunlop (2007) [212]	22	Continuous numeric values 3-4-point Likert scale	✓	✓	✓				Paper	Prior	Waiting Room	Caregiver or Child	N/R	N/R
									N/R	Prior	N/R	Child		
									Paper	Prior	Waiting Room	Caregiver		
Nutrition Screening Tool for Every Preschooler (NutriSTEP) Questionnaire Watson-Jarvis (2011a) [214] Watson-Jarvis (2011b) [215] Andrade (2020) [211]	17	4-point Likert scale Total score 0 to 68 Score classification Low risk (<20) Moderate risk (21-25) High risk (>26)	✓		✓			✓	N/R	During	Waiting Room	Caregiver	✓[221]	✓[221]
									Paper	Prior 1/2 clinic After 1/2 clinic	Waiting Room	Caregiver		
									Paper 2/5 clinics Computer 2/5 clinics N/R 1/5 clinic	Prior 2/5 clinics During 3/5 clinics	Waiting Room 2/5 clinics Appointment Room 3/5 clinics	Caregiver 2/5 clinics Caregiver + Practitioner 2/5 clinics N/R 1/5 clinic		

Starting the Conversation 4-12 tool (STC 4-12) Sharpe (2016) [200]	22	3- or 4-point Likert scale (vary per question) Low risk = 20 Highest risk = 60	✓	✓	✓			✓	N/R	Prior	N/R	Caregiver	N/R	✓[222]
The Family Lifestyle Assessment of Initial Risk (FLAIR) McKee (2010) [210]	19	Yes/No questions 3-point Likert scale Continuous numeric values	✓	✓	✓		✓ Height + Weight	✓	Paper	Prior	N/R	Caregiver	N/R	N/R
12345-FitTastic Williams (2020) [218]	6	6-11 response options per question	✓	✓	✓				Electronic Medical Record	During	N/R	Practitioner	N/R	N/R

Abbreviations: N/R: Not reported; PA: Physical Activity; SB: Sedentary Behaviour; BMI: Body Mass Index; Anthro: Anthropometry

[a]Tools not available for extraction

[b]As reported in the primary study.

5.6.4 Effectiveness in identifying child health behaviours and changing practitioner behaviour, knowledge, or practice

No studies reported on effectiveness of screening related to identifying child health behaviours. Fourteen studies [197-199, 201-205, 207, 211-213, 216, 218] described changes to practitioner behaviours, knowledge, and/or practice in screening for child health behaviours (Table 16). Seven studies reported increased tool use and/or rates of screening [197, 198, 201, 202, 205, 211, 218], three studies reported increased health behaviour discussions/counselling [201, 203, 204] and four studies reported improvements in health behaviour documentation [203-205, 216]. Further, three studies reported improved practitioner self-efficacy in addressing weight and health behaviours [204] and addressing health behaviour goal setting [201]. Of the four studies that measured practitioner intention to use the tool in future, three reported moderate-high intention [199, 213, 218]. Whether these outcomes were a direct result of the intervention is unclear. Practitioner behaviour, knowledge, and practice may have changed as a result of the resources and training that were provided prior to or during the screening intervention.

Table 16: Changes in PHC practitioner behaviour, knowledge, and practice following health behaviour screening

Screening rates	• **Use of the tool increased** from 0% (pre-intervention to 82% (during intervention) (p<0.001) [201] • **Use of screening tool increased** from 0% to 88% (tool not used before project) [217] • 64% of providers reported that tool **increased their rates of obesity screening and education**, 18% of providers reported screening had no impact [218] • **Tool used in 92.2% of visits** [205] • **Training had a positive impact on the use of the tool,** sustained at 3- and 6-month follow up [197] • 92% (n=258) of records had **valid screen completions** [211] • **45% of caregivers completed assessment in appointment** [198]

Health behaviour discussion/ counselling/ promotion	• Caregiver survey indicated **increased health behaviour discussions** [201]:
	  ○ Nutrition (74% pre vs 92% during; p<0.0002)
	  ○ Physical activity (78% pre vs 88% during; p=0.02)
	  ○ Screen time (58% pre vs 79% during; p<0.005)
	  ○ Sugar-sweetened beverages (54% pre vs 82% during; p<0.0004)
	• Improved **correct weight categorisation** (52.2% pre intervention vs 68.1% post intervention) [203]
	• Increase in **routine annual BMI tracking** for all paediatric patients (7% pre vs 29% post) [204]
	• Increased practitioner **routine promotion of healthy behaviours** including [204]:
	  ○ Nutrition (43% pre vs 79% post)
	  ○ Physical activity (50% pre vs 79% post)
	  ○ Screen time (14% pre vs 64% post)
	  ○ Sugar-sweetened beverage consumption (29% pre vs 71% post)

Documentation	• **Significant increases in tool documentation** following dissemination of intervention tools (BMI growth charts, NASH forms, counselling guides and prescription pads) compared to baseline (80.2% vs 49.8% p<0.001) [212]

	• 87% of patient interviews converted to printed summaries [216] • **Improved health behaviour assessment and counselling documentation** [203] • Medical records with tool completion provided **more detailed and consistent nutrition and exercise documentation**, regardless of weight status [203] • **Provider entry of tool into electronic medical record** occurred in 82.9% of visits [205]
Practitioner knowledge and self-efficacy	• **Improved practitioner perceived self-efficacy** in discussing patient readiness for change [207] • Following intervention, practitioners felt they were **more aware of long-term complications related to lifestyle** (71%), **patients were more willing to set behavioural goals** (64), and **patients were more able to self-manage issues related to lifestyle** (50%) [204] • **Increased practitioner perceived self-efficacy** in addressing weight (43% pre vs 93% post) & health behaviours [204] • **Increased practitioner self-reported knowledge** of medical evaluation of paediatric patients with obesity (14% pre vs 36% post), behavioural goal setting (36% pre vs 93% post) and motivational interviewing (57% pre vs 79% post) [204] • **Increased practitioner self-efficacy** in addressing nutrition, physical activity, screen time, sugar-sweetened beverages and behavioural goal setting[201]
Intention to use in future	• Practitioners indicated somewhat (62%) & very likely (23%) to **regularly use tool in future** [213] • Low satisfaction (mean <3.5 out of 5 and median <4 out of 5) with “would continue to use tool” [207] • All practitioners (n = 4) agreed that the tool would be something they would **continue to use in the future and would like to see integrated into their clinical software system** [199] • **90% of providers would continue using tool,** including 69% who would continue without patient incentives [218] • Voluntary nature of screening = not administering screen [211]

5.6.5 Practitioner views and acceptability on health behaviour screening tools

Fourteen studies [196, 197, 199, 201, 203-205, 207, 211, 213-216, 218] described practitioner views on acceptability and/or feasibility of screening (Figure 6 and Table 17). Common views positively impacting practitioner acceptability related to the value of screening [196, 199, 201, 203, 204, 207, 211, 213-215] and features of the tool [204, 207, 213, 216, 218] (Figure 6). Screening was commonly valued as being: useful or helpful in assessing health behaviours and facilitating health behaviour conversations with families; important; beneficial to families; and enhancing clinical sessions [199, 211, 214, 215]. Assorted screening tool features contributed to acceptability of screening, particularly simplicity and clarity [204, 207, 213, 216, 218]. Practitioners' perceptions of feasibility were enhanced by the logistics of implementing screening, such as ease of use [196, 199] and distribution [197]; ease to incorporate with clinic visits [211, 214]; and minimal impact on consultation time [199, 203, 211, 218].

Conversely, negative practitioner perceptions on acceptability and feasibility related to the time required for screening, either undertaking screening or documenting outcomes in medical records [196, 203, 205, 207, 211, 213, 214]. Other factors limiting acceptability and feasibility related to caregiver difficulties completing screening or the wording of questions within the tools [203, 205, 213, 216], disruption to workflow [207], resourcing of IT infrastructure [216], staffing capacity, skills and confidence [199, 203, 205, 207, 216] or suitability of clinic type (i.e., not immunisation clinic) [214].

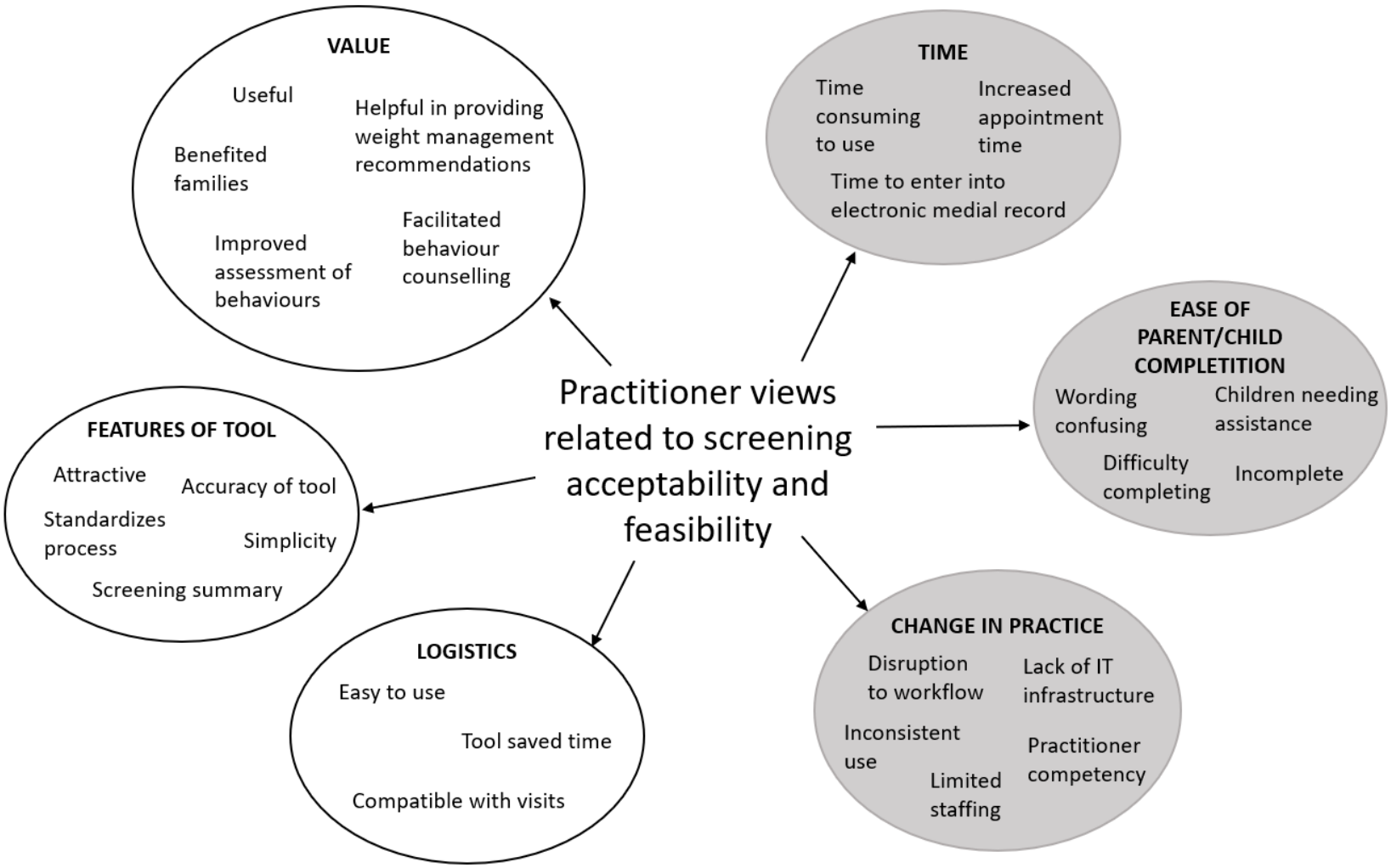


Figure 6: Practitioner views related to health behaviour screening acceptability and feasibility (n = 14 studies)*

*White shading indicates favourable practitioner views, grey shading indicates less favourable practitioner views

Table 17: Practitioner views on acceptability and feasibility of child health behaviour screening

Value of screening	• Useful and effective for patient care [196] • Useful or very useful with patients [201] • Enabled assessment and benefited families [214] • Valued the screen and felt it enhanced the visit [211] • Screening is important [214, 215] • Somewhat or very helpful in assessing and communicating weight-related risk factors [213] • Helpful in providing weight management recommendations [213] • Facilitated healthy eating/weight conversations [211] • Tool is useful and practitioners liked the tool [207] • Tool was useful or somewhat useful, would recommend the tool to other health professionals, and improved their ability to care for the child [199] • Improved dietary and activity assessment and facilitated engagement with caregivers about their child's health habits [203] • Messaging of resources facilitated practice change and empowered practitioners to be proactive with health promotion [204]
Features of tool	• Tool was attractive and helpful for caregivers [213] • Tool is accurate [207] • Simplicity and clarity of tool message [204] • Interview (i.e., screening) and printed summary functioned as good discussion aids [216] • Tool standardizes, facilitates and streamlines healthy lifestyle conservations with families [218]
Logistics	• Helpful and easy to use [196] • Easy to distribute to patients [197]

	• Incorporating screening into clinic was easy [214] • Screening was compatible with visits [211] • Tool was easy/ straightforward to use, tool saved them time [199] • Caregivers completed screen in the waiting room pre-consultation [211] • No increase in time needed to use tool [203] • Able to use screening tool consistently [205] • Tool reduced or did not significantly add to practitioner cognitive workload [218]
Time	• Time consuming [196] • Time was the most frequently mentioned barrier [213] • Common challenge was time [214] • Additional time required [211] • Time to use and increased appointment duration [207] • Electronic documentation of tool into EMR was time consuming [203, 205]
Ease of caregiver/child competition	• Tool wording occasionally confusing for patients [213] • Some caregivers had difficulty completing screen [203] • Not always completed or completed fully [205] • Younger students (i.e., participants) needed extra help completing the interview (i.e., screening) [216]
Change in practice required	• Caused disruption to workflow [207] • Lack of existing IT infrastructure, limited clinical IT support and provider IT skills/discomfort with IT [216] • Limited staffing and resistance to change [216] • Tool required some practice, feeling uncomfortable discussing child weight-related health risk with caregivers [199]

	• Inconsistency with handout distribution by nursing staff [203, 205] • Immunization clinic was not a convenient location to administer tool – caregiver engagement and time [214]

5.6.6 Caregiver views and acceptability on health behaviour screening tools

Eight studies [199, 200, 202, 207, 210, 211, 214, 215] reported the views and acceptability of caregivers on health behaviour screening (Figure 7 and Table 18). Caregivers were receptive to incorporating screening into the PHC setting [210] valuing the opportunity to discuss health behaviours with their practitioner [207, 211]. Caregivers described being treated with care and feeling comfortable during consults with their practitioner [199, 207], although some caregivers in one study reported a fear of being judged or appearing neglectful [210]. Caregivers across several studies were satisfied with the screening tool used and the resulting consultation [199, 207, 215]. Tools that were easy to use, and took little time to read and complete, were acceptable to caregivers [207, 210, 215]. Discussion of risk identification, goal setting, and advice provided by practitioners following screening was well received, found to be useful, and informative for caregivers [199, 202, 207, 210, 215]. Child acceptability was only discussed in one study: most caregivers and practitioners reported children were comfortable with the consultation, while some children experienced feelings of anxiety or demonstrated indifference [199].

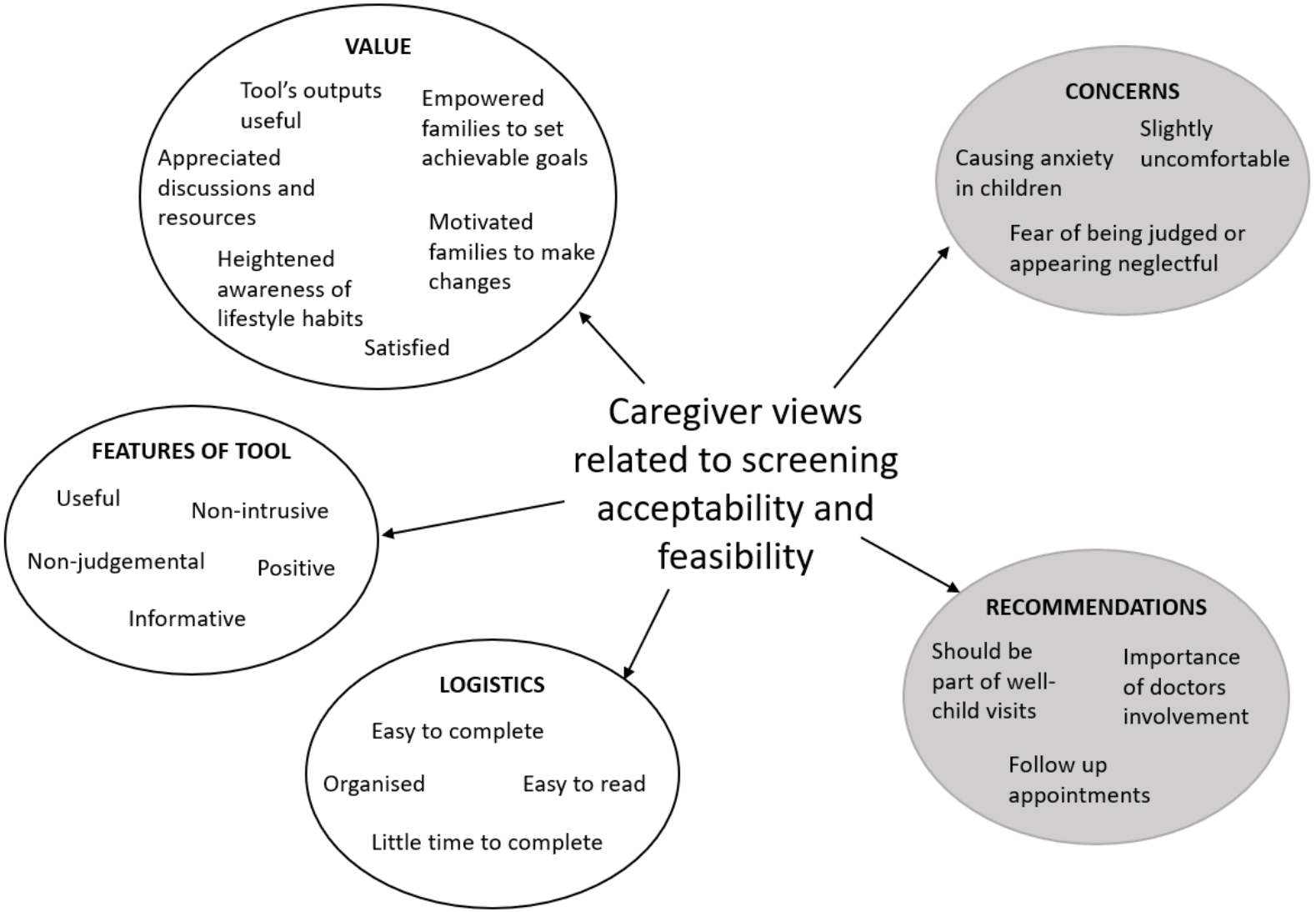


Figure 7: Caregiver views related to health behaviour screening acceptability and feasibility (n = 8 studies)*

*White shading indicates favourable caregiver views, grey shading indicates less favourable caregiver views

Table 18: Caregiver views on child health behaviour screening tools

Study *Tool Name* *First author (Year)* *Country*	**Caregiver views**
The Family Lifestyle Assessment of Initial Risk (FLAIR) screening form McKee (2010) [210] United States	• All families agreed that assessing health behaviours should be part of well-child visits. • Tool was easy to complete and something that should continue. • Fear of being judged or appearing neglectful. • Importance of doctor's involvement in screening. • Positive overall impression of the goal setting and lifestyle counselling. • Appreciated variety of accompanying resources including pamphlets, recipes and websites.
Nutrition Screening Tool for Every Preschooler (NutriSTEP) Watson-Jarvis (2011a) [214] Canada	• 'Easy' or 'very easy' to complete (99%) • 'Moderately' or 'very helpful' for identifying areas of nutrition concern (77%) • Not very helpful (18%) • 'Moderately' or 'very interested' in completing screen in health centre (84%) or practitioners office (81%) • Clerks identified caregiver concern about the amount of reading required
Nutrition Screening Tool for Every Preschooler (NutriSTEP) Watson-Jarvis (2011b) [215] Canada	• 63% of caregivers were satisfied with the service and 38% had a neutral opinion

Nutrition Screening Tool for Every Preschooler (NutriSTEP) Andrade (2020) [211] Canada	• Practitioners reported caregivers appreciated the opportunity to discuss nutrition related issues with practitioners at their scheduled appointments, regardless of their child's nutritional risk score.
The Family Nutrition and Physical Activity (FNPA) risk assessment tool Christison (2014) [207] United States	• Satisfaction survey (5-point Likert scale): caregiver satisfaction with the tool was high • Tool was easy to read, easy to fill out and little time to complete • Discussion with provider was helpful, important, made caregivers feel comfortable, right amount of time, and felt practitioner listened • Lower scores for motivating family and child change
Computer-Assisted Treatment of CHildhood overweight (CATCH) Park (2015) [199] United Kingdom	• All caregivers (n = 14) reported that they and their child felt comfortable with the consultation and being asked about their child's lifestyle and medical history • Caregivers were satisfied (n = 12) or 'somewhat satisfied (n = 2) with the tool-aided consultation • One caregiver was 'slightly uncomfortable' when asked about whether their child had been teased/bullied. • Caregivers found it 'useful' (n = 11) or 'somewhat useful' (n = 3) to receive personalised feedback • All caregivers agreed that they were treated with care and concern, that their child's care was well organized and that they had confidence and trust in their practitioner. • Consults described as positive, informative, nonjudgmental, and nonintrusive. • Caregivers found the tool's outputs useful. • Two caregivers described consultation causing some anxiety in their children.

	• Caregivers found the lifestyle advice informative and instructive, particularly specific advice on diet as being useful. • Follow-up appointments for monitoring, guidance and practical support would be beneficial (n = 5)
Starting the Conversations (STC) 4-12 tool Sharpe (2016) [200] United States	• Discussion helped motivate entire family to make healthier changes • One behaviour change goal empowered families to set achievable goals and avoid feeling overwhelmed
Healthy Habits Questionnaire Gibson (2016) [217] United States	• Tool heightened caregiver awareness of the lifestyle habits of the family and motivated the caregiver to make changes in their diet and physical activity

5.6.7 Training and resources needs

Eleven studies described practitioner-identified needs to support screening implementation [196, 197, 199, 202, 204, 207, 211-214, 216] (Table 19). These included: affordable provider/practitioner training and technical assistance [196, 197, 211, 212, 216], practitioner resources to use alongside the screening tool such as referral pathways or behaviour change examples [199, 202, 204, 211, 213], the integration of the screening tool into Electronic Medical Records [199, 207], including reminders [211], Dietitian support and/or follow up [211, 214], patient (caregiver/child) educational resources [211], and administrative support/capacity for implementation sustainability [204, 211].

Table 19: Practitioner identified training and resources needs alongside child health behaviour screening

Training	• Training to providers about the tool [211, 212] • Skill building training [196] • Training to providers about how to prioritise and assess most important behaviours [216] • Affordable and practical in-service training [197] • Training and technical assistance [211]
Practitioner Resources	• More tangible support such as a structured program of activities + follow up consultations to monitor patients [199] • Behaviour change list + Examples of exercise + healthy meal options for children [213] • Key primer booklet [211] • Access to ready-to-use resources alongside the screening tool [204] • Decision support chart as part of resource toolkit [217]
Electronic Medical Records	• Integration of tool into electronic medical records, automatic calculation of assessment [199, 207] • Integration of reminders into EMRs [211]
Dietitian support	• Onsite nutritionist/dietitian available for drop-in follow-up visits [214] • Registered dietitian roles [211]

Administrative support	• Administrative staff roles [211] • Practitioners depended on administrative staff to administer the screening tool and implementation sustainability was contingent on capacity of front-end administrative staff [204]
Patient education Resources	• Educational resources [211]

5.7 Discussion

This systematic review identified and comprehensively described 14 unique child health behaviour screening tools used in Primary Health Care (PHC) settings located across the United States, United Kingdom, and Canada. Screening tools measured child health behaviours across the four domains of diet, physical activity, sedentary behaviour, and sleep, as well as related caregiving practices; however, only four screening tools included items across all four health behaviour domains. Screening tools were effective in changing practitioner self-reported behaviour, knowledge, self-efficacy in screening for child health behaviours, and in the provision of health behaviour education. To our surprise, no studies reported on effectiveness of screening related to identifying child health behaviours. The majority of included studies described practitioner or caregiver views on screening, indicating an overall high acceptability of health behaviour screening and feasibility within PHC. Training, resources, and integration into existing systems were identified as essential for implementation and screening success. This demonstrates health behaviour screening to be acceptable, feasible and suitable for implementation in PHC, however the effectiveness on identifying child health behaviours and impact on child health outcomes is unknown.

Overall, this review identified a lack of brief, validated, and reliable screening tools for use in the PHC setting that comprehensively measure all four child health behaviour domains. Only four screening tools identified measured all four health behaviour domains and none were tested for validity or reliability [199, 202-205, 209]. This highlights a need for high-quality, rigorously developed, and validated screening tools that measure all four behaviour domains to enable health practitioner and caregiver conversations that can positively impact child health behaviours. Similar to previous reviews examining health behaviour measurement tools [125, 126], few tools focused on child sleep, indicating that sleep behaviours remain a comparatively novel area for early screening and intervention compared with diet and activity behaviours. This review demonstrated the effectiveness of screening tools in changing practitioner knowledge, attitudes, and practice; but given that all studies used practitioner self-report measures, more robust evaluation of effectiveness are necessary to corroborate these findings.

Of the included studies, three-quarters reported on practitioner or caregiver acceptability and feasibility of screening, with most reporting positive indicators of acceptability and feasibility, such as finding screening tools valuable, easy to use and compatible with visits. Practitioners also indicated negative indicators of acceptability including time burden, limited staffing

capacity, and incomplete and inconsistent completion of tools. Nonetheless, the depth of evaluation is limited. Heterogeneity in the evaluation designs, populations, data collection measures, reporting depth, and mixed findings of included studies, restricts our ability to draw firm conclusions on the acceptability and feasibility of screening from the current body of literature. For successful and sustained implementation of health behaviour screening in PHC settings, acceptability needs to be carefully evaluated from multiple perspectives including practitioners, support staff, practice managers, caregivers, and children. Some studies included practice managers perspectives, and one study included caregiver-reported child perspectives, highlighting clear gaps. While screening was reported by practitioners and caregivers as valuable, feasibility may require further exploration as there were inconsistencies in practitioner views on the logistics of screening being easy to use versus time consuming to perform. Time burden is a particularly important consideration in PHC settings, because of existing time pressures and demand for existing priorities and responsibilities of PHC practitioners, including the treatment and management of disease and injury. As behaviour screening is proposed as a complementary practice to growth monitoring, time to conduct screening and undertake behaviour-directed conversations with caregivers needs to be appropriately resourced and funded. Given that studies often reported single aspects of acceptability or feasibility, or perspectives from only certain viewpoints, there is a need for future comprehensive assessment and co-design with key partners to inform an acceptable and cost-effective implementation approach in PHC.

Challenges to implementing a change in routine practice include a lack of funding, resources, time, and the need for administrative and managerial support [134]. Our review found a need to support PHC practices in these challenges, through providing adequate practitioner training and resources, integration into electronic medical records, administrative and dietitian support and patient education resources. Practitioners require adequate training to learn a new practice and feel confident and supported to implement the practice as part of their routine care. Literature suggests that it takes 17–20 years for the adoption of new interventions into routine practice [10]. This demonstrates that implementing a change in practice requires more than just screening tool dissemination, but a proactive and substantive collaboration with key partners and the provision of adequate training and resources [223, 224]. This is supported by the findings of our review, which describes many practitioner-identified challenges to implementing a new practice of health behaviour screening. Practitioners identified training needs to support implementation and intervention success and highlighted the importance of integration of a

screening tool into electronic medical records, staff roles and capacity and practitioner resources such as decision support charts, examples of specific behaviour change strategies and follow up consultations. This aligns with the findings of Krijger and colleagues [126] who identified the importance and need for specific actions following screening that extend beyond counselling to address target behaviours, such as repeating screening after a certain time and referral to multidisciplinary team members. Qualitative literature also suggests engagement, open discussions, and buy-in from PHC practitioners as vital to support adoption of new practices in PHC settings [225]. Successful implementation of health behaviour screening is achievable, but requires unique and adaptable implementation strategies, tailored to the context and needs of the clinic, to support successful integration into PHC.

5.7.1 Strengths and considerations

The results of this review should be considered in the context of strengths and limitations. The strengths include: (1) the review protocol being prospectively registered on PROSPERO with methodology according to PRISMA guidelines [148] (2) the use of a comprehensive search strategy developed in collaboration with academic librarians across five databases, (3) contacting corresponding authors to retrieve screening tools not included in publications to enable complete assessment of screening tools. The primary limitation of this review is the exclusion of articles not published in English, grey literature, and unpublished theses, which may have limited inclusion of additional relevant literature or capturing of additional screening tools. Included studies also only came from the US, UK, and Canada, limiting the generalisability to PHC settings in other countries. The quality of included articles should also be recognised with most (17 of 22) included studies scoring 40% or lower using the MMAT critical appraisal tool, with Mixed Methods and Non-randomised studies being the most poorly reported. This highlights a lack of high-quality evidence within the limited body of literature regarding health behaviour screening in PHC. Data relating to tool validity and reliability in this review are described as reported by the primary study. The quality of this evidence was not reviewed. Further evaluation of the quality of studies reporting tool measurement properties should be evaluated using COSMIN guidelines.

5.7.2 Implications for future research, policy, and practice

Key themes of Australian national public health policy include prioritising preventive health through screening and early intervention, indicating policy alignment for health behaviour screening as a potential early intervention and health promotion strategy [21, 90]. This review highlights several important avenues for future research that will be required to work towards policy directives regarding the implementation of screening and early intervention in PHC settings. While this review has identified several health behaviour screening tools that have been used in PHC, there is a lack of evidence regarding the validity and reliability of tools that assess all relevant health behaviour domains (i.e., nutrition, physical activity, sedentary behaviour, and sleep). Prior to the implementation of health behaviour screening tools in PHC, the validity and reliability should be investigated to ensure the utility of these tools as screening instruments [226]. The design of future research and screening tool development should be informed by a variety of key partners, including health practitioners, other PHC staff, caregivers, and children, and should incorporate rigorous testing for tool validity and reliability to understand the measurement quality. Collaborative engagement with these end users would provide valuable insight into feasible, acceptable and context specific approaches to the implementation of health behaviour screening in PHC settings, as well as the support required to embed screening in routine care [12, 14].

5.8 Conclusion

Few screening tools exist to facilitate comprehensive screening of children's health behaviours in PHC. Practitioners reported increased knowledge, self-efficacy, confidence and increased rates of documentation and health behaviour counselling, in addition to the barriers, enablers, training, and resource needs alongside screening tools. These findings provide new knowledge about the existence, implementation, acceptability, and feasibility of health behaviour screening tools, with mostly positive views. However, the body of literature also demonstrates a need for more comprehensive evaluation of the effectiveness on child health outcomes, psychometric properties of tools, and practitioner informed implementation strategies to enable integration into PHC. This review highlights the potential of health behaviour screening as an acceptable and feasible strategy to comprehensively assess and provide early intervention for children's health behaviours in PHC settings.

5.9 Chapter Summary

This chapter reports the outcomes of a systematic review describing the effectiveness, acceptability, and feasibility of child health behaviour screening tools that have been developed and tested in Primary Health Care (PHC) internationally. The findings suggest that screening children's health behaviours in PHC is feasible and acceptable to PHC practitioners and caregivers. Further research investigating effectiveness of child health behaviour screening is required. This review demonstrates a lack of comprehensive child health behaviour screening tools tested in an Australian PHC context. The next chapter reports the results of workshops with Australian PHC practitioners to inform the development of a fit-for-purpose child health behaviour screening tool suitable for the Australian PHC context.

6 CHILD HEALTH BEHAVIOUR SCREENING IN PRIMARY HEALTH CARE: NOMINAL GROUP TECHNIQUE WORKSHOPS WITH AUSTRALIAN PRACTITIONERS

6.1 Chapter Overview

This chapter addresses Objective 3 of the thesis and presents the results of Study 3. South Australian Primary Health Care (PHC) practitioners were invited to be involved in a Nominal Group Technique workshop, to generate ideas and solutions for implementing child health behaviour screening in PHC.

Relevant Thesis Objective: Identify and prioritise PHC practitioner generated tool features and supports to implement and embed child health behaviour screening in PHC (Objective 3).

A version of this chapter has been submitted to a peer-reviewed journal for publication.

Co-author contributions: Dimity Dutch (DD) facilitated all virtual workshops with the assistance of Alexandra Manson (AM) as notetaker. DD conducted analysis and synthesis of idea generation results and coordinated online voting. Lucy Bell (LB), Sarah Hunter (SH), Elizabeth Denney-Wilson (EDW) and Rebecca K Golley (RKG) provided supervision throughout the research process, including agreement on results synthesis and interpretation. DD drafted the manuscript. All authors contributed to reviewing, editing, and approving the final version of the paper.

6.2 Abstract

Background: Primary Health Care (PHC) is a key setting for monitoring and promoting child health behaviours including dietary intake, physical activity, sedentary behaviour, and sleep. Screening tools to monitor child health behaviours are needed and poses an emerging opportunity to overcome barriers and challenges to current practice in PHC.

Objectives: Workshops with PHC practitioners aimed to 1) identify key features to include in a child health behaviour screening tool, and 2) understand the supports needed to implement child health behaviour screening in PHC.

Methods: Workshops using the Nominal Group Technique method aimed to generate, filter and prioritise ideas. The four-step consensus-building process included individual brainstorming, round robin, group discussion and voting. Participants were eligible to participate if they were a South Australian PHC practitioner that work with children aged 5 years or under in a PHC setting.

Findings: Nine virtual workshops were facilitated via Microsoft Teams with two practitioner groups: 1) General Practice (GP) and Allied Health (n = 21) and 2) Child and Family Health (n = 8). Ten practitioner generated features of a screening tool and 10 supports to facilitate implementation of a screening tool into PHC practice were identified. Top ranked features included *'Clear results and next steps'* and *'Question design and response format'*. *'Practitioner training'* and *'Practitioner resources'* were key supports for implementation.

Conclusions: Practitioners identified tool features and implementation supports that would aid adoption of a child health behaviour screening tool in PHC. Consistent findings across practitioner groups demonstrate tool features and implementation strategies that are likely to be widely accepted. Unique findings demonstrate context specific tool features and implementation strategies. This study provides important insight into practitioner needs to guide the development of a child health behaviour screening tool that will be acceptable to end users and facilitate a supportive prevention environment in PHC.

Keywords: Screening, Monitoring, Health Promotion, Health Behaviours

6.3 Introduction

The first five years of life is a critical stage of development, rapid growth, and laying foundations for children's health behaviours relating to dietary intake, physical activity and sedentary behaviours and sleep habits [24, 25, 55]. These key modifiable health behaviours track and influence health across the life course [32-34]. Primary Health Care (PHC) is a familiar and valued setting for caregivers of young children due to the long and trusted relationships developed during regular encounters [72]. This includes a schedule of regular PHC visits including routine health and development checks and immunisation appointments in general practice settings, as well as multidisciplinary allied health and child and family health services [91]. Core elements of these services include health and developmental screening, health promotion, early identification of family need and risk, and responding to identified need through education and intervention [158, 185]. PHC is therefore an ideal setting for early intervention and health promotion to support optimal growth, health, and development in the early years.

Monitoring and promoting child health behaviours are key responsibilities of universal PHC, supported by national PHC guidelines and policy priorities [5, 97, 158]. Screening for child health behaviours provides an opportunity to monitor and provide tailored health promotion advice and support to families. This approach aligns with the *5A's Framework (ask, assess, advise, assist, and arrange)* which is used to guide the delivery of preventive care in routine practice [97]. Screening tools to measure child health behaviours in PHC exist internationally [126, 183], however there is a lack of practical tools and resources suitable to the Australian PHC context [183]. Valid and reliable screening tools for measuring health behaviours in Australian children that can be used in PHC settings are needed to support early intervention and tailored health promotion [125, 126, 183].

6.4 Aim & Objectives

Aim: Understand Primary Health Care (PHC) practitioner generated solutions and strategies to embed early child health behaviour screening within routine PHC in South Australia.

Objectives:

1. Identify PHC practitioner generated features of a child health behaviour screening tool for use in routine PHC
2. Understand practitioner generated supports needed to implement child health behaviour screening in routine PHC

6.5 Methods

6.5.1 Study Design

This quantitative study employed the Nominal Group Technique (NGT) method to engage Primary Health Care (PHC) practitioners to generate prioritised ideas on child health behaviour screening in PHC. Reporting follows the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement [154] (Appendix 6). Ethics approval was obtained from the Flinders University Human Research Ethics Committee (HREC 6514, Appendix 7) and the Women's and Children's Health Network Human Research Ethics Committee (HRE 00322, Appendix 8). A Site Specific Assessment was also conducted and approved by the Women's and Children's Health Network (Appendix 9).

The NGT method is an orderly and collaborative consensus process designed to generate, filter, and prioritise ideas and solutions to questions posed to a small group of participants [152, 153]. The NGT is a structured and resource efficient method for group idea generation and prevents dominance of individuals and minimises group thinking [17, 149]. Virtual NGT workshops allow for scheduling flexibility [227], particularly to accommodate busy PHC practitioner schedules, and encourage participation regardless of location.

The NGT process involves four stages: 1) silent idea generation, 2) round robin discussion, 3) clarification and collapsing, and 4) voting. Silent idea generation requires participants to independently, and silently, reflect and record their ideas to answer a research question. Round robin discussion involves participants sharing one idea from their list to the group at a time. During clarification and collapsing, participants are asked to clarify their ideas, as well as exclude, include, combine or alter ideas. In the final stage, participants are asked to vote for their top three ideas.

6.5.2 Participants

Eligible participants were South Australian PHC practitioners that work with children aged five years or under in a PHC setting and who had adequate computer and English literacy skills.

Guidelines for NGT workshops recommend no more than 7-10 participants per workshop [17, 149]. This study used a convenience and purposeful sampling approach with snowball recruitment strategies. Purposeful recruitment of PHC practitioners via email invitation (Appendix 10) and at in-person professional development events. Relevant professional organisations were also contacted to distribute recruitment information within internal

newsletters and email distribution lists (Table 20). Workshop participants were also asked to share recruitment information with their networks and colleagues (snowball recruitment). Additional recruitment via social media was more opportunistic, with efforts made to tag and share relevant professional organisations to increase awareness.

Table 20: Professional organisations contacted to recruit PHC practitioners for NGT workshops

Organisations
Adelaide Primary Health Network
Country SA Primary Health Network
Maternal Child and Family Health Nurses Association
Healthy Development Adelaide
The Royal Australian College of General Practitioners
Sonder
Health2Go Flinders University
Wellbeing SA
GPEx
Lively Eaters
Adelaide Paediatrics
Southern Early Childhood and Family Services

Practitioners were provided with a participant information sheet (Appendix 11) and completed a brief demographic questionnaire via online survey software (Qualtrics, Provo, UT) including gender (male, female, non-binary/third gender), current role (paediatrician, general practitioner, child and family health nurse, nurse practitioner, health service manager, speech pathologist, occupational therapist, physiotherapist, dietitian, other), experience in role (weeks, months, years), and questions confirming their availability, eligibility, and informed consent to participate (Appendix 12). Participants were invited via email to attend the second workshop, providing consent via accepting and attending the workshop.

6.5.3 Data Collection

All participants attended an idea generation workshop to complete steps 1-3 of the NGT method. Participants were invited to participate in a second consensus workshop to vote and prioritise ideas to complete the fourth step of the NGT method.

6.5.3.1 Workshop 1: Idea Generation

Participants attended a 60-90 minute online exploratory workshop to identify, define, and discuss key features and resources to support implementation of child health behaviour screening in PHC. Prior to the workshop, participants were provided with summary infographic to provide background context to what would be discussed in the NGT workshop (Figure 8). At the commencement of the workshop, participants were provided with a 10–15-minute introductory presentation that set the context and provided background information on health behaviour screening tools that have been developed and tested internationally and the rationale for the current research. The agenda for the idea generation NGT workshops is shown in Figure 9. Data collection documents are presented in Appendix 13.

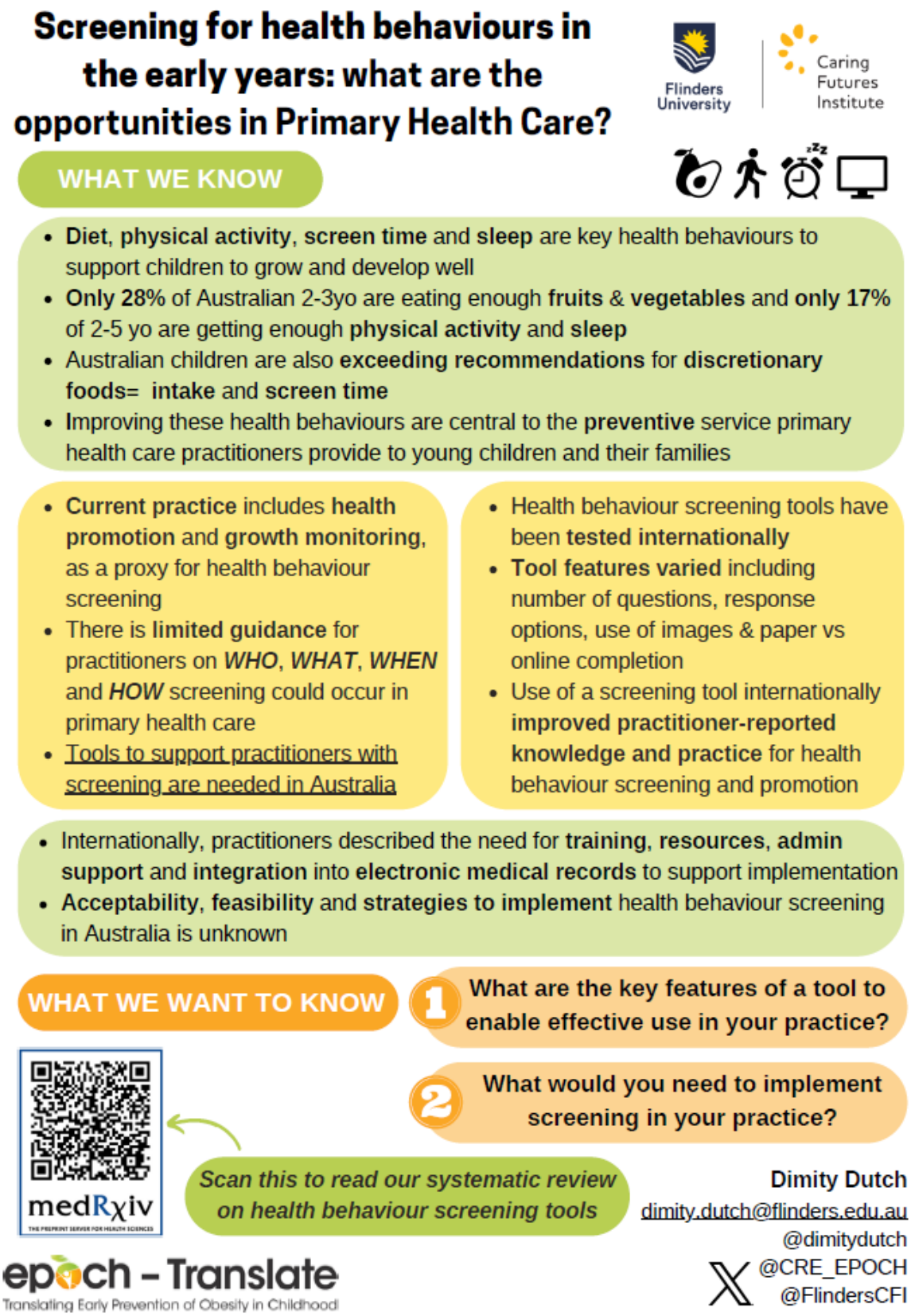


Figure 8: Summary Infographic provided to PHC practitioners prior to idea generation NGT Workshop

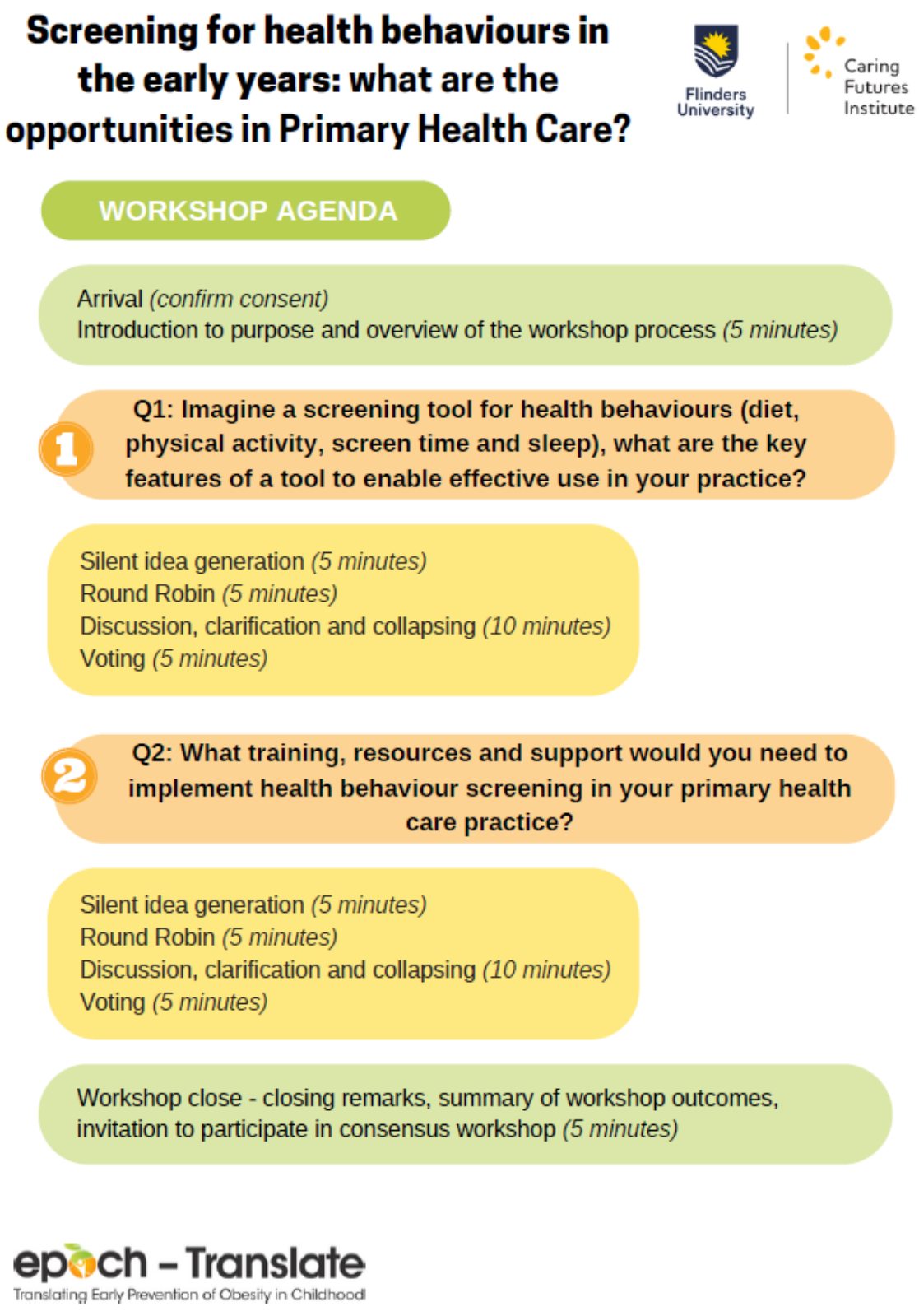


Figure 9: Agenda for idea generation NGT Workshops

Idea generation workshops followed the NGT process for two questions:

Question 1 – *"Imagine a screening tool for health behaviours (i.e. diet, physical activity, sedentary behaviour, and sleep), what are the key features of the tool to enable effective use in your practice?"*

Question 2 – *"What training, resources and supports would you need to implement health behaviour screening within your primary health care setting?"*

The questions were informed using the Knowledge to Action (KTA) Framework [23]. The KTA Framework is a conceptual framework to support integrated knowledge translation of evidence-based interventions from research into practice [23]. As child health behaviour screening poses a new approach for monitoring and promoting health behaviours in PHC, the KTA Framework provides a useful framework to guide knowledge creation and synthesis, as well as the important considerations for implementation in practice.

All workshops were conducted, recorded and transcribed via Microsoft Teams and note-taking was facilitated via a live shared Microsoft Word document (Version 16). Idea generation workshops were held between October 2023 and March 2024, with the same workshop facilitator (DD) and workshop scribe and notetaker (AM).

6.5.3.2 Workshop 2: Consensus

At the completion of each idea generation workshop, participants were asked if they were happy to be contacted to be involved in a second workshop.

A 60-minute consensus workshop was confirmatory in nature and aimed to collapse, refine, and agree on key features and resources required to support implementation of child health behaviour screening in PHC. To be flexible, those who were interested in participating in a second workshop, but were unable to attend, were given the opportunity to contribute to consensus voting via an online survey. Consensus workshops and surveys were conducted between December 2023 and March 2024. Consensus workshop data collection documents are presented in Appendix 14.

6.5.4 Data analysis

During each idea generation workshop, ideas generated were recorded on a live word document. Results from idea generation workshops were collated and synthesised by the workshop facilitator (DD) prior to the consensus workshop using Miro, an online whiteboard software [228].

During the consensus voting process, participants were asked to vote for their top three ideas via an online survey. Participants were asked to allocate a score of 3 for their top idea, through to a 1 for their third idea. Key results include the total votes, voting frequency and the relative importance score for each idea to allow comparison between practitioner groups who participated in online consensus voting. Relative importance score was calculated by dividing total votes by the total maximum potential votes the idea could receive and is presented as a percentage, with higher scores demonstrating higher importance to participants. The three top-ranked ideas were then shared back to participants. Analysis was performed using Microsoft Excel (Version 16). As workshops were audio-recorded and transcribed, qualitative insights from discussions were used to provide context and rationale to the identified and prioritised ideas [16, 149].

6.5.5 Reimbursement

Remuneration for PHC professional's time taken to be involved in the workshop was provided based on current published sitting fees of $35 per hour [229]. To account for 1-hour preparation time and 2-hour workshop, practitioners were remunerated up to $105 per workshop to cover potential loss of income. Health professionals will be able to waive sitting fees.

Child and Family Health Nurses were supported to participate during their workload/role and therefore weren’t remunerated as per organisational policy, as there was no associated loss of income.

6.5.6 Handling of withdrawals and strategies to manage risk

Participants were able to withdraw from the study at any time, by notifying the research team that they no longer wish to continue participation in the study. The following information was included in the information sheet (Appendix 11) to ensure participants are aware that they can withdraw from the research project without penalty at any time: *"You may, without any penalty, decline to take part in this research study. If you decide to take part and later change your mind, you may, without any penalty, withdraw at any time without providing an explanation. To*

withdraw, please contact the Chief Investigator or you may just refuse to answer any questions or leave the workshop."

Participant recruitment also included organisations and practitioners with previous working relationships. Participants were informed of the research team. We did not foresee any particular discomfort or risks for participants in taking part. Workshop participants were required to contribute their time to be involved in the study, however, were remunerated for time taken to be involved. Individual participants are not identifiable in any results from the study, however other workshop participants may be able to identify participant contributions even though they will not be directly attributed to participants.

6.6 Results

6.6.1 Participants

A total of eight idea generation workshops were held with twenty-nine Primary Health Care (PHC) practitioners. One consensus workshop was held. All participants were female with two to 27 years of experience in their current role. Of the 29 PHC practitioners who participated in an idea generation workshop, seven attended a second consensus workshop, and 27 contributed to online consensus voting. Two practitioners were lost to follow up and did not contribute to online consensus voting.

Twenty one of 29 participants were recruited through purposeful, convenience, and snowball sampling, and participated in one of six workshops that represented diverse General Practice (GP) and Allied Health practitioners including dietitians, speech pathologists, occupational therapists, and others. The remaining eight participants were recruited via the South Australian Child and Family Health Service and participated in one of two workshops with nurses within this organization. Therefore, results are presented to represent these two practitioner groups, 1) GP/Allied Health workshops and 2) Child and Family Health workshops.

See Table 21 for details of GP/Allied Health and Child and Family Health workshops, including date held and number of participants that attended. Figure 10 demonstrates participants flow through the Nominal Group Technique (NGT) method including idea generation and consensus workshops, and Table 22 presents a summary of participant characteristics.

Table 21: Details of GP/Allied Health and Child and Family Health Workshops

	Date Held	Participants attended
GP/Allied Health Workshops		
Idea generation 1	13/10/2023	4
Idea generation 2	17/10/2023	3
Idea generation 3	19/10/2023	3
Idea generation 4	9/11/2023	3
Idea generation 5	14/11/2023	4
Idea generation 6	20/11/2023	4
Consensus	5/12/2023	7 attended, 20 voted
Child and Family Health Workshops		
Idea generation 1	5/3/2024	4
Idea generation 2	13/3/2024	4
Consensus (online voting only)	N/A	7 voted

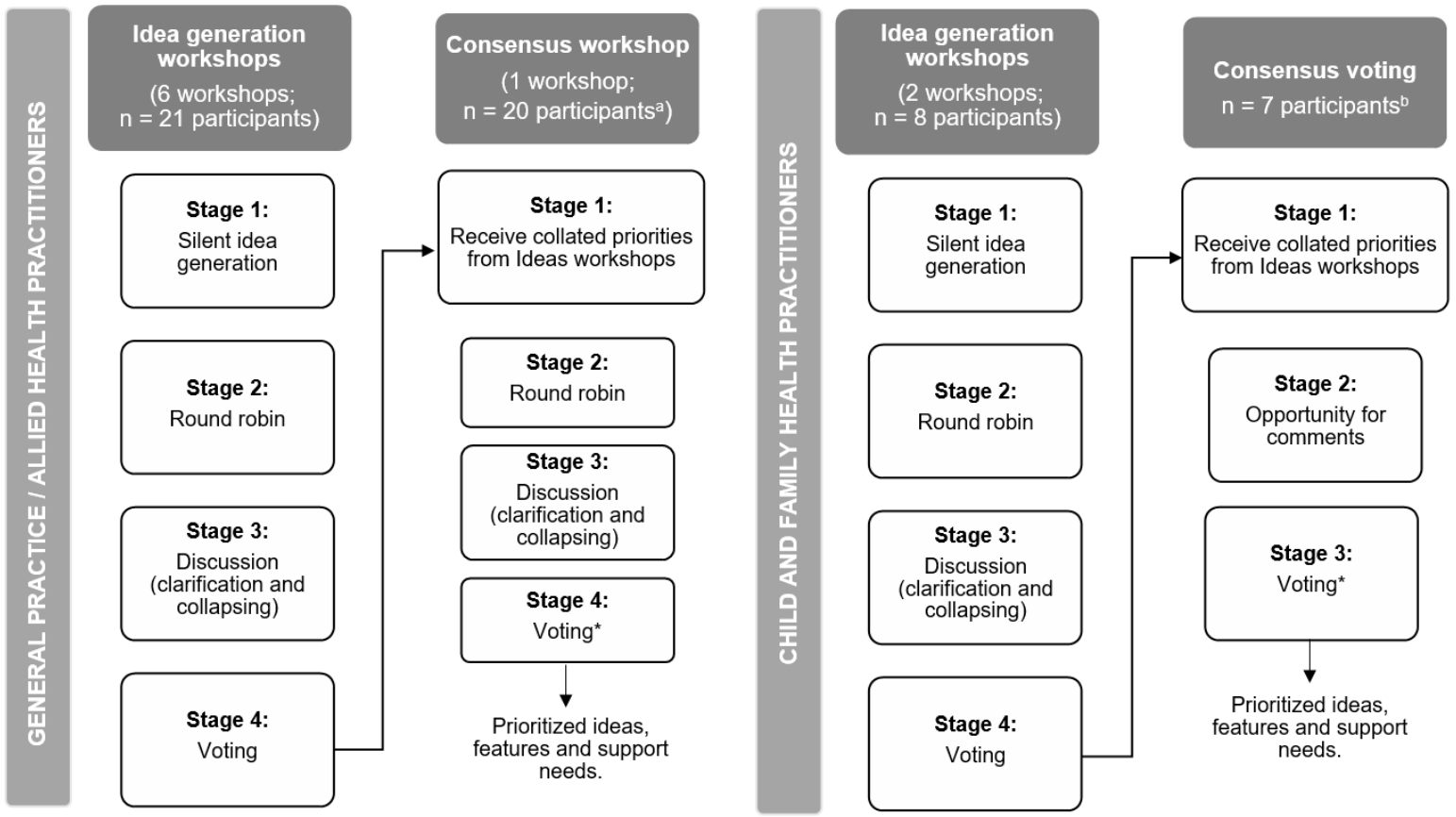


Figure 10: Flowchart of NGT method for idea generation and consensus workshops with GP/Allied Health and Child and Family Health practitioners

[a]n = 20 GP/Allied Health practitioners participated in consensus voting process, n = 7 attended consensus workshop and n = 13 participated in electronic voting only

[b]n = 7 Child and Family Health nurses participated in consensus voting process, n = 1 lost to follow up

**Voting presented in results*

Table 22: Idea generation and consensus workshop participant characteristics

	General Practice/ Allied Health Workshops (n = 21 practitioners)	**Child and Family Health Workshops** (n = 8 practitioners)
Current Role		
Dietitian	4	-
Speech Pathologist	4	-
Occupational Therapist	3	-
General Practitioner	3	-
Paediatrician	2	-
Practice Nurse	1[a]	-
Exercise Physiologist	1	-
Optometrist	1	-
Physiotherapist	1	-
Clinical Psychologist	1	-
Child and Family Health Nurse	-	8[b]
Years of experience in current role		
0-5 years	5	2
5-10 years	7	2
10-15 years	2	1
15+ years	7	3
Gender[c]		
Female	21	8

[a]Practice Nurse did not participate in consensus voting (female with 12 years of experience in current role)

[b]One Child and Family Health Nurse did not participate in consensus voting (female with 15+ years of experience in current role)

[c]Participants selected gender from options "male", "female", "non-binary/third gender", or "prefer not to say"

6.6.2 Idea Generation Workshops Summary of Results

GP/Allied Health (n = 6 workshops) and Child and Family Health (n = 2 workshops) practitioners identified 59 and 23 features, respectively, for a health behaviour screening tool, and 46 and 15 supports, respectively, to facilitate adoption and use of the screening tool in PHC. See Table 23 for GP/Allied Health idea generation workshop results and Table 24 for Child and Family Health idea generation workshop results.

Ideas generated in practitioner workshops were then synthesised and summarised. See Figure 11 and Figure 12 demonstrating synthesis of GP/Allied Health ideas and Figure 13 and Figure 14 for Child and Family Health ideas. See Table 25 describing the resulting 10 unique tool features and 10 unique supports to facilitate tool adoption which were carried through to consensus voting.

Table 23: General Practice/Allied Health idea generation workshop results

Q1: ***"Imagine a screening tool for child health behaviours. What are the key features of a tool to enable effective use in your practice?"***					
Workshop 1	**Workshop 2**	**Workshop 3**	**Workshop 4**	**Workshop 5**	**Workshop 6**
• Accessibility • Automation • Categories • Examples • Pictures • Number of questions • Fast and brief • Simple and easy to fill out • Ability to be used by multidisciplinary teams • Language and definitions • Gender	• Family led, clinician supported • Flexible mode of delivery • Response categories/ options • Accessible language and visuals • Built-in education • When it is completed	• Easy to read/complete • Online – with in person option • QR code used • Graphic results • Culturally appropriate • Age specific • Motivation to complete & change • Embedded into medical software • Non-judgemental • Inclusive	• Easy to administer and interpret • Validity • Timing of completion • Clear cut off criteria • Format – online, survey, paper • Acceptable to stakeholders • Intervention available • Able to be used in the community and/or health sector	• Preliminary scene setting resource • Timing of completion • Mode of completion • Short • Quantifiable • Screening vs assessment • Acceptable to parents and children • Engageable format • Credibility • Shame avoidant • Clear direction • Quality of information • Simple language phrases • Staged resources • Question types • Applicable across the family	• Easy for parents to use • Timing of completion • Online version • Conversation enabling • Language and framing • Parent reflective on behaviours • Clear purpose of the tool

Q2: ***"What training, resources and supports would you need to implement screening in your practice?"***					
Workshop 1	**Workshop 2**	**Workshop 3**	**Workshop 4**	**Workshop 5**	**Workshop 6**
• IT support to create document/IT contact • Report of results • Funding • Modules or video training (Practitioner and parents) • Scoring guides • Certification • Client examples • Concise 'manual' • Prompts for next steps • Free to access • Advertisement of tool	• Training • Caregiver information • Practitioner information sheets • Interprofessional exchange of information • Workplace structures/ systems/support • Community awareness • Network of professionals across different domains	• Outcomes data • Online training modules/ resource • Motivational interviewing skills/ communication skills • Consistent health messages and guidelines • Appropriate admin support/for specific practice • Able to be tailored for online systems	• Support from the MBS to implement • Monitoring uptake • Training practitioner • Follow up mechanism • Pathway to follow up • Sharing results • Ongoing evaluation of the efficacy of the tool • Support for parents	• Clear instructions, resources and next steps for practitioner • Accessible • Community awareness • Communication between practitioners • Integration into routine practice • Patient resources • Tracking	• Conversation prompts for practitioners • Training • Time in consult • Resources for practitioners on next steps • Information hub • Referral pathways • Parent resource

Table 24: Child and Family Health idea generation workshop results

Q1: "Imagine a screening tool for child health behaviours. What are the key features of a tool to enable effective use in your practice?"	
Workshop 1	**Workshop 2**
• Accessibility • Availability, but not required • Resources • Easy to understand • Age considerations • Client motivation/clear purpose • Non-judgemental/framing • Length of tool • Timing • Next steps/Referral pathways • Response options	• Timing • Clear purpose/demonstration of the purpose behind tool • Easy to understand • Culturally appropriate • Scoring/summary at end • Non-judgemental/framing • Mode of completion • Age appropriate • Monitor/tracking • Goals/education/resources provided • Next steps/referral pathways • Simple to use • Clinical judgement
Q2: "What training, resources and supports would you need to implement screening in your practice?"	
Workshop 1	**Workshop 2**
• Dedicated practitioner • Education/training for practitioner • Dedicated resources for practitioner • Dedicated resources for the family	• Timing for practitioners • Goals/education/resources provided • Referral pathways • Education for caregivers

• Promotion from CaFHS/Awareness • Partnership with other services • Integration with health care record • Staffing considerations	• Promotion from CaFHS/Awareness • Appointment times • Managerial support

Figure 11: Synthesis of GP/Allied Health practitioner ideas (NGT Question 1)

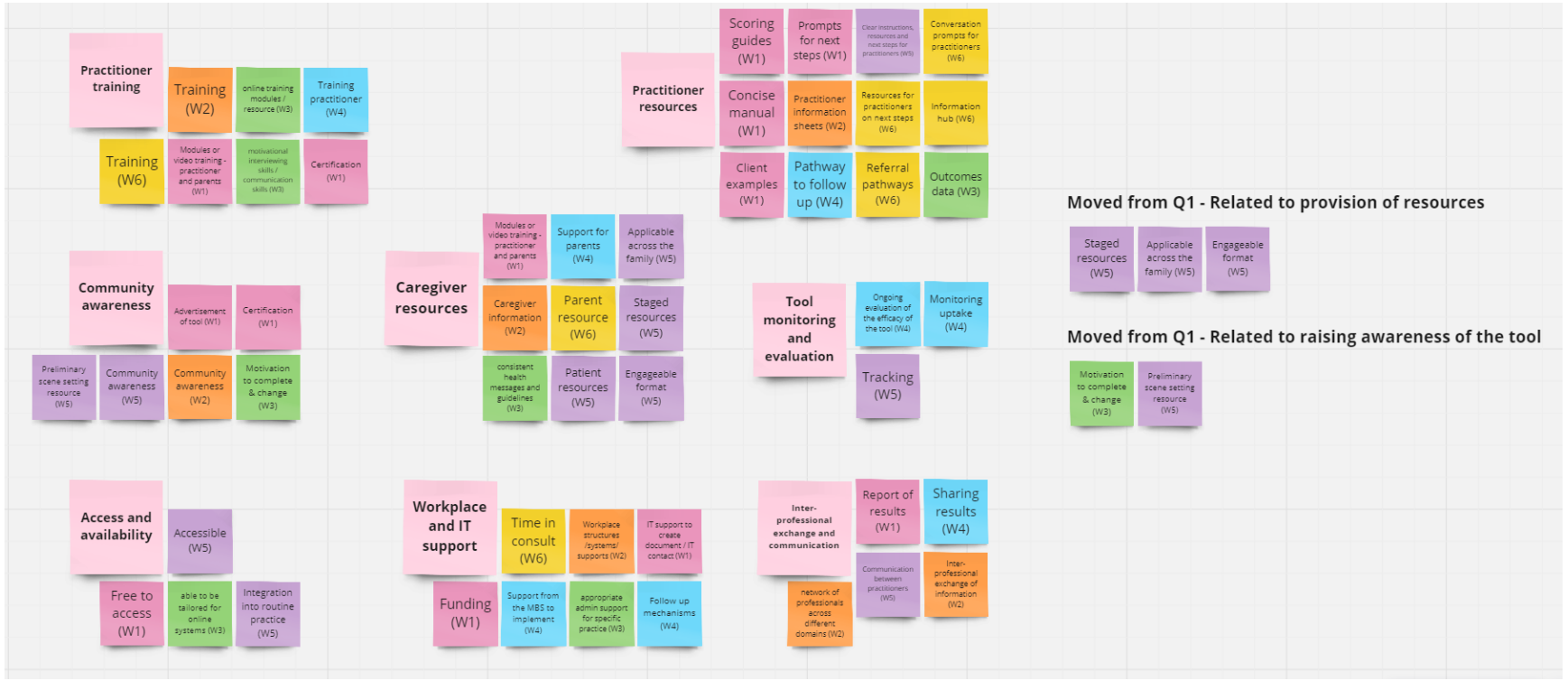


Figure 12: Synthesis of GP/Allied Health practitioner ideas (NGT Question 2)

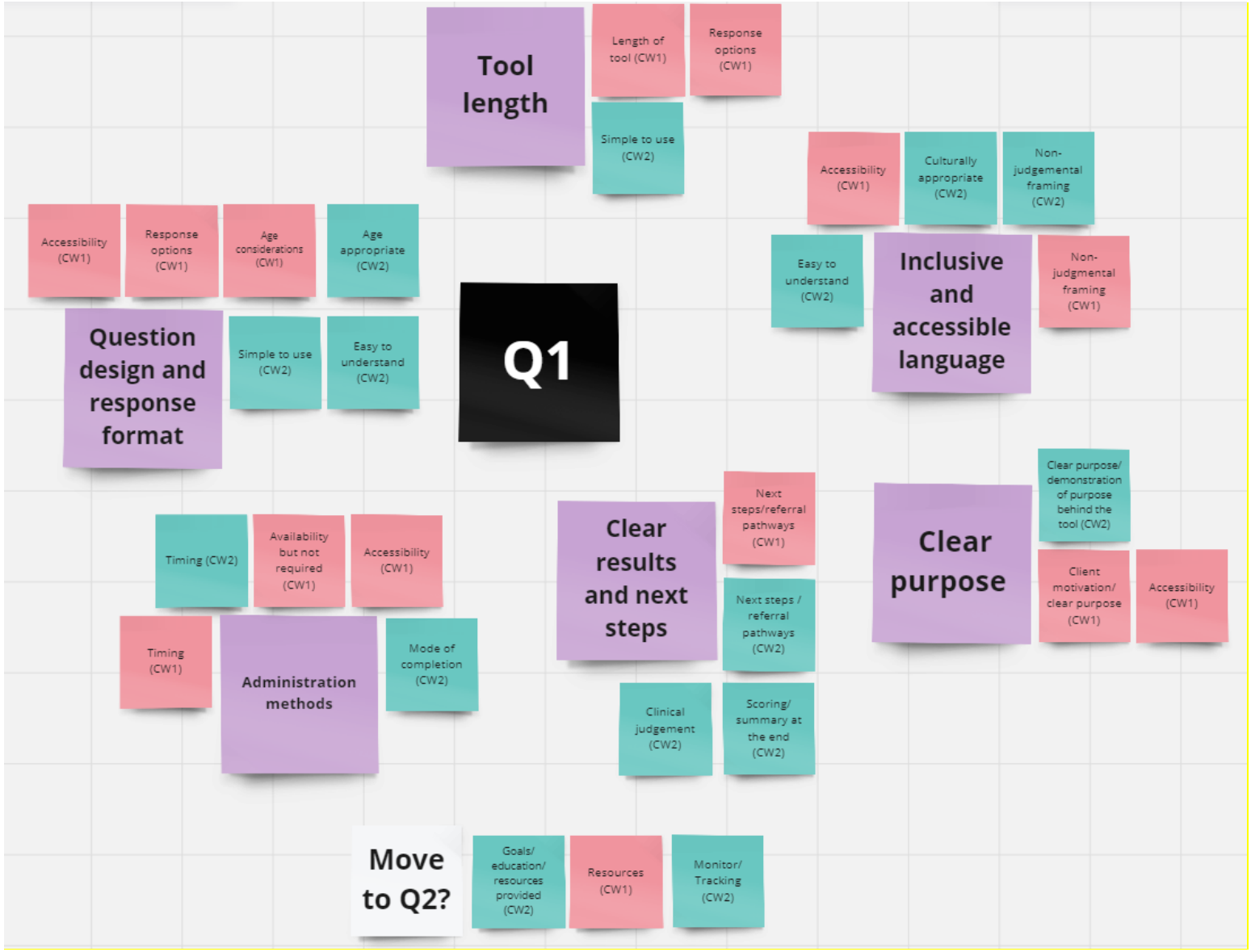


Figure 13: Synthesis of Child and Family Health practitioner ideas (NGT Question 1)

Figure 14: Synthesis of Child and Family Health practitioner ideas (NGT Question 2)

Table 25: Ideas for tool features and supports to facilitate tool adoption identified by GP/Allied Health and Child and Family Health practitioners

Q1: ***"Imagine a screening tool for child health behaviours. What are the key features of a tool to enable effective use in your practice?"***			
Idea	**Explanation of idea**	**Identified by GP/Allied Health practitioners**	**Identified by Child and Family Health practitioners**
Tool length	Number of questions/items and how long it takes to complete the tool. Importance of keeping tool brief i.e. 5-10 minutes to complete or 4-6 questions per health behaviour domain.	✓	✓
Question design and response format	Questions designed to capture quality and quantity of health behaviours. Easy to complete i.e. inclusion of multiple choice, Likert-scale, and tick-box responses. Opportunity for caregivers to elaborate/flag concerns in free-text responses. Age-specific versions of the tool.	✓	✓
Administration methods	Electronic or paper-based versions of the tool available. Tool able to be completed by caregiver or practitioner. Opportunity to complete tool prior to consult (home or waiting room) or during consult.	✓	✓
Clear results and next steps	Tool results available for caregivers and practitioners. Opportunity to prompt for further support and follow up i.e. clear referral pathways, relevant guidelines, and provision of tailored information.	✓	✓

Inclusive and accessible language	Simple, easy to understand English, suitable for low-literacy populations. Strengths-based and positive framing to avoid shame and stigma, identify what families are doing well, and empower caregivers to make positive changes.	✓	✓
Images and visuals	Visual and engaging tool Images to support interpretation of questions and prompt response.	✓	
Psychometric properties	Tool validity i.e. tool needs to accurately identify children that require further assessment or support and not lead to over-referrals or false positives. Consideration of tool sensitivity and specificity.	✓	
Technological functions	Integrated and embedded into medical practice software, allowing to flag reminders, documentation, and ongoing monitoring. Link to complete tool can be included in appointment reminder alert. QR codes can be scanned on caregivers personal device to complete in waiting room. Automated scoring of results and summary report for caregivers.	✓	
Multidisciplinary and sector use	Tool able to be used across all settings and services were children and families are already visiting, supporting consistent messaging and a whole of family approach.	✓	
Clear purpose	Brief statement on the purpose of the tool and why it is important, linking to lifelong health. Caregivers and practitioners being familiar with the tool's purpose to encourage use and motivation for behaviour change.		✓

Q2: *"What training, resources and supports would you need to implement screening in your practice?"*			
Idea	**Explanation of idea**	**Identified by GP/Allied Health practitioners**	**Identified by Child and Family Health practitioners**
Practitioner training	Limited or no training required if tool is easy to complete and use. Comprehensive training with refresher training available, delivered in-person and virtually, CPD points or certification available. Training available to all practice staff – i.e. administration, practice managers and practitioners. Training on how to administer, score and interpret the tool's results, background information on why the tool is importance, inclusive language and strengths-based framing, cultural safety, social determinants of health and clinical judgement using the tool.	✓	✓
Practitioner resources	Practitioner manual or suite of resources including why the tool is important, how to administer the tool, client examples, scoring guides, conversation prompts and communication guide, clear recommendations, resources and referral pathways. Resources should be easy to access, available online and updated regularly to ensure currency.	✓	✓
Caregiver resources	Consider existing resources from trusted organisations and services. Screening tool could include links to trusted resources embedded within the tool.	✓	✓

	Information/resources to support a whole of family approach. Colouring in sheets, stickers or magnets for children as a thank you for completion. Resources available in languages other than English. Resources should be easy to access, available online and updated regularly to ensure currency.		
Community awareness	Advertisement and promotion of the tool to raise awareness amongst caregivers and practitioners i.e. videos, emails, promotion at relevant events, waiting room posters, practitioner certification, embedding tool within existing resources, guidelines, websites, and mobile phone applications. Promotion of the importance of early intervention and preventive health services and programs.	✓	✓
Workplace and IT support	Workplace and managerial support to enable screening tool to be used effectively and consistently. Administration support for dissemination, promotion and reminders for completion. IT support to enable integration within existing medical practice and record keeping software, providing evidence of completion and outcomes Potential integration into child health record. IT support to enable automated scoring and generation of results, and ability for results to be shared amongst practitioners and services.	✓	✓

	Medical Benefit Schedule (MBS) items to enable appropriate billing and time allocation in consult.		
Tool monitoring and evaluation	Monitoring and evaluation of tool uptake, implementation, completion rates, practitioner and caregiver acceptability and efficacy as a tool to support children's health behaviours over time.	✓	✓
Access and availability	Free to access and use. Able to be adapted and tailored to various medical practice software programs. Integrating into existing routine services including the Child Health Record or My Health Record.	✓	
Interprofessional exchange and communication	Shared results and communication between practitioners and services to reduce repeated completion and ensure consistent messaging in recommendations. Network of practitioners to enable multidisciplinary and sector collaboration and care including referral pathways, feedback of results and communication of resources and supports provided.	✓	
Partnership with other services	Partnership with other services with aligned motivations to reduce reliance on one practitioner/service/program to meet all needs. Consideration of accessible and affordable options in different locations.		✓
Staff roles and capacity	Practitioners within a service trained and act as a "champion" to provide practitioner training, support, and advocate for screening tool use.		✓

	Importance of integrating screening tool into existing appointment times Consideration of additional staff required to implement and support sustained use of the tool.		

6.6.3 Consensus Workshop Results

Table 26 presents prioritised ideas for features of a child health behaviour screening tool and support needs for tool use as determined by consensus voting.

Table 26: Consensus voting results and importance score of the key features and support needs by practitioner group (n = 20 GP/Allied Health practitioners; n = 7 Child and Family Health practitioners)

Tool Feature	Participants that voted for feature	Total number of votes	GP/Allied Health importance[a,b] (%)	Tool Feature	Participants that voted for feature	Total number of votes	Child and Family Health importance[a] (%)
Clear results and next steps	17	36	60	Question design and response format	7	16	76
Question design and response format	9	21	35	Clear results and next steps	5	11	52
Tool length	8	20	33	Clear purpose	4	7	33
Inclusive and accessible language	7	12	20	Inclusive and accessible language	3	5	24

Technological functions	4	8	13	Administration methods	2	2	10
Psychometric properties	3	7	12	Tool length	1	1	5
Multidisciplinary and sector use	5	6	10				
Administration methods	3	3	5				
Images and visuals	2	2	3				
Support need	**Participants that voted for feature**	**Total number of votes**	**GP/Allied Health importance[a, b] (%)**	**Support need**	**Participants that voted for feature**	**Total number of votes**	**Child and Family Health importance[a] (%)**
Access and availability	12	23	38	Practitioner training	4	11	52
Practitioner resources	10	23	38	Practitioner resources	4	7	33

Practitioner training	8	21	35	Staff roles and capacity	4	7	33
Interprofessional exchange and communication	7	12	20	Community awareness	2	5	24
Caregiver resources	7	11	18	Caregiver resources	3	4	19
Tool monitoring and evaluation	6	11	18	Partnership with other services	2	4	19
Community awareness	5	11	18	Workplace and IT support	1	3	14
Workplace and IT support	4	7	12	Tool monitoring and evaluation	1	1	5

[a]Importance score (%) calculated by [total votes received/maximum potential votes]. Maximum potential votes: 60 for GP/Allied Health practitioner group and 21 for Child and Family Health practitioner group.

[b]One GP/Allied Health practitioner didn't vote properly – they voted "1" for Q1 and then "2" and "3" for Q2

Abbreviations: GP = General Practice

6.6.3.1 Practitioner generated features of a child health behaviour screening tool

Figure 15 shows ideas identified by GP/Allied Health and Child and Family Health practitioners in order of importance score. Five identified features were consistent across GP/Allied Health and Child and Family Health practitioners groups: (1) tool length, (2) question design and response format, (3) administration methods, (4) inclusive and accessible language and (5) clear results and next steps. Prioritised tool features as determined by consensus voting are described below with selected participant quotes. See Appendix 15 for full list of relevant participant quotes.

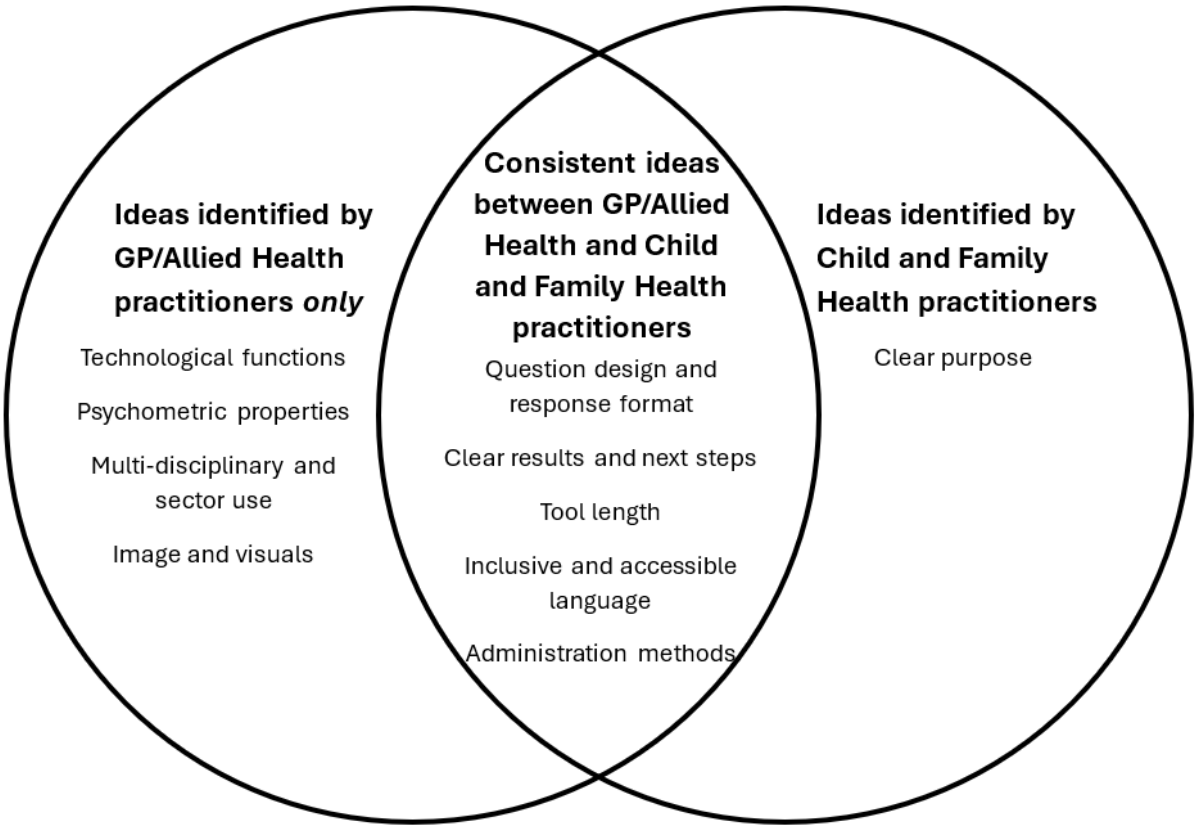


Figure 15: Practitioner generated ideas of features of a child health behaviour screening tool: comparison of results between GP/Allied Health and Child and Family Health practitioners

Clear results and next steps

'Clear results and next steps' was identified as the top and second highest ranked feature for a child health behaviour screening tool by GP/Allied Health practitioners (60% importance score) and Child and Family Health practitioners (52% importance score), respectively. Practitioners

described the importance of the tool having a clear scoring system, with results that are easy to interpret, available in a summary report for families, and use to inform the provision of health promotion information, resources or referral pathways.

> ‘The scoring would need to be easy to interpret and provide clear feedback like on next steps and maybe links to guidelines.’ (GP practitioner, Workshop 4)

> ‘Part of ease of use is the ability to quickly analyse the data and determine whether it's a screening pass or the child needs further assessment.’ (Allied Health practitioner, Workshop 4)

Question design and response format

‘Question design and response format’ was identified as the top and second highest ranked feature for a child health behaviour screening tool for Child and Family Health practitioners (76% importance score) and GP/Allied Health practitioners (35% importance score), respectively. Practitioners highlighted the importance of simple and easy to understand questions that are age appropriate and categorised by health behaviour domain. Practitioners discussed tick-box response options to encourage completion by busy parents, with open text response boxes to elaborate on any concerns they might have about their child’s health behaviours.

> ‘Something quite easy for parents to use, so something quite simple tick box type questionnaire, but then having room to elaborate on some of the sort of more key points’ (Allied Health practitioner, Workshop 6)

> ‘I'd like to see a tool that’s electronic and user friendly and it's customized so it can be age-appropriate bit like the ASQ that's age appropriate for their age.’ (Child and Family Health Nurse, Workshop 8)

Tool length

‘Tool length’ was identified as the third highest ranked feature for a child health behaviour screening tool for GP/Allied Health practitioners (33% importance score). Child and Family Health practitioners also identified ‘Tool length’ however was not prioritised highly (5% importance score). Practitioners described the importance of a brief tool so that is it acceptable for both the caregiver to complete and practitioner to use in their practice.

> ‘should be very quick and easy, rather than having to write down, you know, monitor their child for a week and ohh they move on average 30 minutes.’ (GP practitioner, Workshop 2)

> ‘It would need to be concise or brief. So probably one to two pages or 10 to 15 questions maximum.’ (GP practitioner, Workshop 4)

Clear purpose

'Clear purpose' was identified as a unique and third highest ranked feature for a child health behaviour screening tool for Child and Family Health practitioners (33% importance score). Practitioners described the importance of caregivers and practitioners knowing the purpose of the tool to encourage use and completion.

> 'Important to have like a bit of an explanation as to why we're doing the tool…a brief statement as to why it's important' (Child and Family Health nurse, Workshop 7)

> 'Demonstration of the purpose behind doing the tool, and the magnitude of primary health care at this age' (Child and Family Health nurse, Workshop 8)

Inclusive and accessible language

'Inclusive and accessible language' was identified as the fourth highest ranked feature for a child health behaviour screening tool for GP/Allied Health practitioners (20% importance score) and Child and Family Health practitioners (24% importance score). Practitioners described the importance of simple and easy-to-understand language to support completion of families with low-literacy or English as a second language. Strengths-based language and framing was also discussed by practitioners to ensure the screening tool doesn't contribute to caregiver guilt or shame.

> 'If the way that the tool was kind of designed and set up and the prompts on it were quite strengths-based, it could be really useful for everybody that uses it' (Allied Health practitioner, Workshop 6)

> 'Not using really difficult language, so easy to understand' (Child and Family Health Nurse, Workshop 7)

6.6.3.2 Practitioner generated support needs to facilitate use of a child health behaviour screening tool

Figure 16 shows support needs identified by GP/Allied Health and Child and Family Health practitioners in order of importance score. Six were consistent across GP/Allied Health and Child and Family Health practitioners; (1) practitioner training, (2) practitioner resources, (3) caregiver resources, (4) community awareness, (5) workplace and IT support and (6) tool monitoring and evaluation. Prioritised support needs as determined by consensus voting are described below with selected participant quotes. See Appendix 15 for full list of relevant participant quotes.

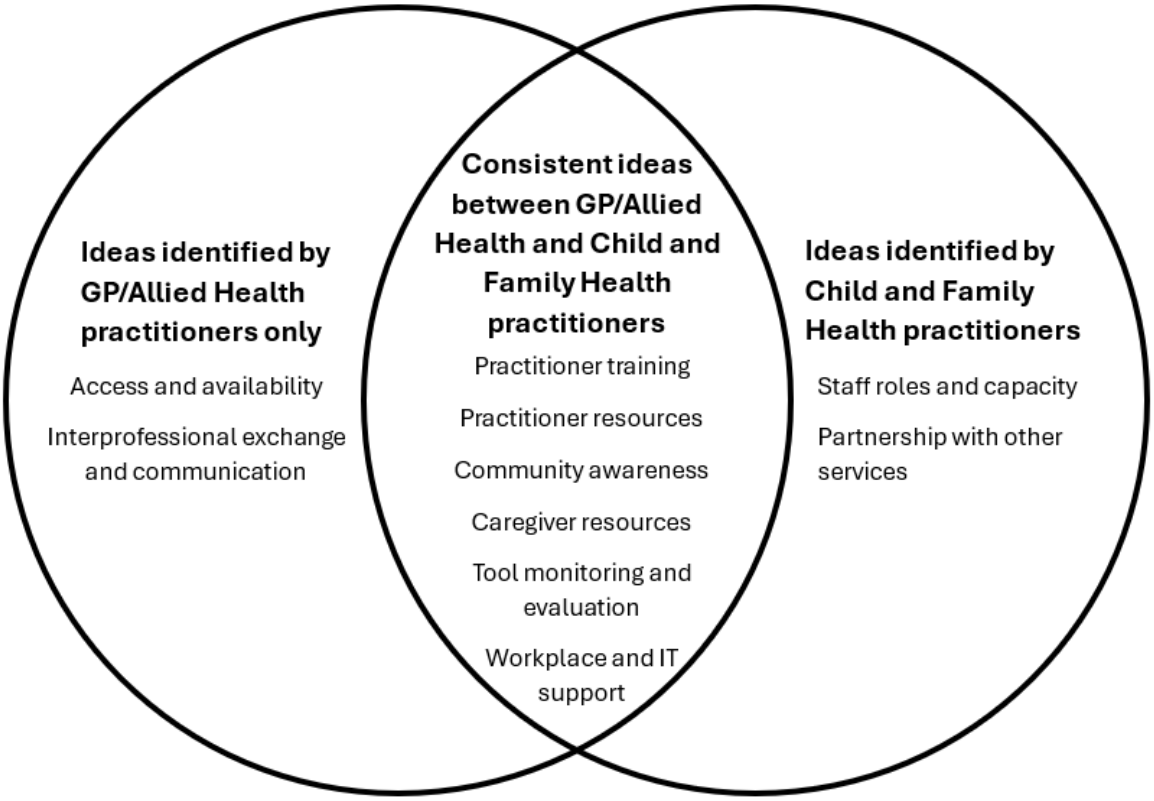


Figure 16: Practitioner generated ideas of support needs to facilitate implementation of child health behaviour screening: comparison of results between GP/Allied Health and Child and Family Health practitioners

Practitioner training

'Practitioner training' was identified as the top and third highest ranked support need by Child and Family Health practitioners (52% importance score) and GP/Allied Health practitioners (35% importance score), respectively. Practitioners described that in-person and online training regarding the purpose of the tool, health behaviour guidelines and strengths-based approaches should be available, but not mandatory prior to using the tool in practice.

> 'Part of any screening tool, it is educating the practitioner on why is this important' (GP practitioner, Workshop 2)

> 'I think maybe in terms of education for the practitioner, I think even though I suggested that eLearning and the MS Teams, sometimes they like face-to-face Workshop is better for engaging.' (Child and Family Health Nurse, Workshop 7)

Access and availability

‘Access and availability’ was identified as a unique and equal top support need by GP/Allied Health practitioners (38% importance score). Practitioners described the tool being available online for caregivers and practitioners to use or embedded within routine services so that it is universally accessible to families.

> ‘Free to access always helps with more people doing that screening, which then helps with that sort of systemic change as well.’ (Allied Health practitioner, Workshop 1)

> ‘Have the screen as part of their routine care, so piggybacking it or in meshing it, or linking it with other common presentations for kids in that first thousand days would be really good.’ (GP practitioner, Workshop 2)

Practitioner resources

‘Practitioner resources’ was identified as an equal top and second highest ranked support need by GP/Allied Health practitioners (38% importance score) and Child and Family Health practitioners (33% importance score), respectively. Resources described by practitioners included information on the background of the tool, health behaviour recommendations, strengths-based framing, conversations guides, and lists of relevant services to facilitate referral pathways.

> ‘Milestones or guidelines for the practitioner to kind of support those conversations or and some recommendations or like some prompts’ (Allied Health practitioner, Workshop 6)

> ‘Some kind of guide guiding document guide book or like an online thing that's easier or something explaining why it's been framed in this way and the importance of actually using it in this way that strengths-based to actually promote healthy behaviours and not just create pressure which then actually reduces healthy behaviours.’ (Allied Health practitioner, Workshop 6)

Staff roles and capacity

‘Staff roles and capacity’ was identified as a unique and third highest ranked support need by Child and Family Health practitioners (33% importance score). Child and Family Health practitioners highlighted the need for additional time and support in order to conduct additional health behaviour screening within current limited capacity.

> ‘We need to adjust length of appointments or additional appointments that we can book families into if they would like some specific support on healthy lifestyle’ (Child and Family Health Nurse, Workshop 7)

Interprofessional exchange and communication

‘Interprofessional exchange and communication’ was identified as the fourth highest ranked support need by GP/Allied Health practitioners (20% importance score). Practitioners described the need for communication between practitioners and services to avoid unnecessary repeat screening and to communicate why screening was conducted, the results, and what next steps have been recommended.

> ‘Having a network of professionals who have awareness, which is almost comes to marketing, but also we're talking about interprofessional exchange of information or making the tool readily shared between professionals. (GP practitioner, Workshop 2)

> ‘Making sure that there's some kind of structure in place so that the results are shared between relevant parties and also that you're not screening a child who's already had a screening or missing a child who says they've been screened but really hasn't been.’ (Allied Health practitioner, Workshop 4)

Community awareness

‘Community awareness’ was identified as the fourth highest ranked support need by Child and Family Health practitioners (24% importance score). GP/Allied Health practitioners also identified ‘Community awareness’ but prioritised less highly (18% importance score). Practitioners described the need for raising awareness of the tool amongst practitioners and the wider community through marketing, posters or videos that can be displayed in clinic waiting rooms and promotional materials for parents to take home.

> ‘We also need the community to know it exists and it might need a bit of marketing’ (GP practitioner, Workshop 2)

> ‘It's all about awareness at first’ (Allied Health practitioner, Workshop 5)

6.7 Discussion

Child health behaviour screening poses an opportunity to support Primary Health Care (PHC) practitioners to monitor, promote, and discuss all four child health behaviour domains. Our findings suggest PHC practitioners would use a child health behaviour screening tool if it were easy to understand, complete, and has clear results to inform next steps. The need for practitioner training and resources to support use of a screening tool in routine PHC practice was prioritised. To support use and acceptability of the tool across PHC settings, the screening tool and associated resources must be multidisciplinary and use a strengths-based approach. Implementation would be aided by adapting and tailoring the tool for different PHC contexts. Overall, this study provides important insight into diverse practitioner perspectives on child health behaviour screening and marks an essential step towards developing an acceptable tool to support children's growth, health, and development in Australian PHC.

A brief and easy to complete screening tool that has clear results to inform next steps could support PHC practitioners to consistently monitor and discuss children's health behaviours aligned with PHC guidelines. This is consistent with caregiver perspectives, describing the need for a brief and easy to complete screening tool that provides clear courses of action [230], critical for tool completion by caregivers in busy PHC waiting rooms, potentially while caring for multiple children. Screening tools tested in PHC internationally demonstrate increased health behaviour conversations, increased practitioner confidence, and evidence of practitioner and caregiver acceptability [126, 183, 231].

Practitioners identified the need for further training and resources to facilitate the implementation, use, and effectiveness of a child health behaviour screening tool in routine PHC practice. This is aligned with previous Australian research [95, 118, 232, 233]. Practitioner training and resources are key enablers to implementing PHC guidelines [178, 234], particularly supporting practitioner knowledge and confidence to have strengths-based conversations to promote health behaviours [134, 235]. Consistent with practitioner-identified needs internationally [183], tools should also be supported by caregiver resources, adequate workplace structures, staff capacity and professional and community awareness [234, 236].

A screening tool that can be used across disciplines and sectors, utilising inclusive and accessible language was described across PHC practitioner groups. Children are seen by different practitioners, across different services and settings, at different time points and frequencies, reinforcing the need for consistent health promotion messaging across routine and

opportunistic encounters [4]. The benefit of a holistic approach recognises that health promotion is a responsibility that should be shared across disciplines, services, and sectors [5]. Tools and resources therefore need to be shared and communicated between practitioners and services and referral pathways can be facilitated by leveraging existing networks and partnerships. This can reduce caregiver and practitioner burden, minimise duplication of screening or missing a child that requires screening. Practitioners also described language and framing that encapsulates a strengths-based, whole-of-family approach to supporting children's health written at a low readability level. A non-judgemental approach helps identify what families are doing well and empowers caregivers to make positive changes, addressing the known barriers and limitations of weight-focused conversations. This framing is particularly important when engaging with culturally and linguistically diverse families [237] and those who have had previous negative experiences in PHC [238].

While some findings were consistent for tool features and support needs across diverse PHC settings, there were unique findings to suit context specific needs. Tailoring interventions to context is an important step to support implementation [23] and can enhance reach, adoption, and acceptability [239]. Length of appointments is a common barrier to delivering preventive care in current practice [185]. This highlights the need for additional or longer appointments, reintroduction of a Medicare Benefit Schedule item similar to the discontinued Healthy Kids Check [240], or utilising clear care pathways to make brief PHC touchpoints an opportunity to signpost to other resources and services. Integrating the screening tool within medical software including appointment reminder systems and electronic medical records may also encourage caregiver completion prior to the appointment and enable timely discussions and identification of children that require further assessment or support. Child and Family Health practitioners also emphasised the tool needing a clear purpose to support with caregiver buy in and motivation to complete. Context specific needs, as described within this study, highlight the importance of engaging with practitioners to ensure interventions are tailored to the needs of those who are going to use it in practice.

6.7.1 Strengths and considerations

This study is based on a small sample of PHC practitioners from one jurisdiction in Australia. Participation was voluntary, potentially capturing the most interested and passionate practitioners related to prevention in PHC, and therefore might have perspectives different to other PHC practitioners. All participants were female; however, this likely reflects the PHC workforce [241]. A pragmatic and flexible approach to recruitment and data collection was adopted to capture the perspectives of practitioners with different professional backgrounds and years of PHC experience. To support busy practitioner schedules and limited capacity, workshops and voting were conducted entirely online, however this might have been a barrier for some practitioners or impacted engagement in discussions. The Nominal Group Technique (NGT) method generated both quantitative and qualitative data to understand, refine and prioritise PHC perspectives on child health behaviour screening. Workshop questions were aligned with the KTA Framework, recognising the importance of practitioner perspectives on both tool design and resources to support implementation and considering different PHC contexts.

6.7.2 Implications for future research, policy, and practice

Our findings demonstrate PHC practitioners are interested in screening for child health behaviour and require tools and resources to support this in practice. Brief interventions in PHC, including screening, tailored advice and referral to additional resources or services are increasingly needed to enable delivery of preventive care in time poor PHC settings. Understanding practitioner perspectives is crucial to ensuring tools and resources meet practitioner needs and therefore are acceptable and adopted into routine practice. Access and awareness of a child health behaviour screening tool would be facilitated through integration into PHC practice guidelines, developing clear care pathways across PHC services, and leveraging community and education services including playgroups and library services. Findings from this study reiterate the importance of a multidisciplinary and sector approach, through partnership and collaboration, to support children's growth, health, and development in the early years. Future research to understand caregiver's perspectives on child health behaviour screening is required, in addition exploring feasibility and acceptability of screening in practice. Development of screening tools suitable for older children, adolescents and adults may also support the continuation of health behaviour conversations in PHC across the lifespan.

6.8 Conclusion

Primary Health Care (PHC) practitioners described features of a child health behaviour screening tool to enhance acceptability and strategies to facilitate implementation. A child health behaviour screening tool that is easy to complete and understand and provides clear results and next steps is warranted in PHC. A multidisciplinary and strengths-based approach to tool design, as well considering access and integration into medical software is required. Practitioner training and resources are needed to accompany the screening tool, and to enable implementation across services, settings and sectors. This study describes key PHC practitioner perspectives to inform the design and implementation of an acceptable child health behaviour screening tool to facilitate a supportive prevention environment in PHC.

6.9 Chapter Summary

This chapter reports the outcomes of Nominal Group Technique (NGT) workshops with South Australian Primary Health Care (PHC) practitioners to understand key features and resources to support implementation of child health behaviour screening in PHC. Results from this chapter will be used to inform the development of a fit-for-purpose child health behaviour screening tool for Australian PHC described and pilot tested in Chapter 7.

7 CAREGIVER ACCEPTABILITY AND FEASIBILITY OF CHILD HEALTH BEHAVIOUR SCREENING IN PRIMARY HEALTH CARE – A MULTI-METHOD PILOT STUDY AT HEALTH2GO

7.1 Chapter Overview

This chapter addresses Objective 4 and 5 of this thesis and presents the results of Study 4, a multi-method pilot acceptability study at a multidisciplinary Primary Health Care (PHC) clinic. A summary of methods and results are presented in this chapter.

Relevant Thesis Objectives:

- Develop a child health behaviour screening tool for use in primary health care and understand caregiver acceptability of the tool within practice
- Understand caregiver perspectives, experiences, and acceptability of child health behaviour screening within primary health care

A version of this chapter is being prepared for submission to a peer-reviewed journal for publication.

Co-author contributions: Dimity Dutch (DD) conducted all recruitment and data collection. Lucy Bell (LB), Sarah Hunter (SH), Elizabeth Denney-Wilson (EDW) and Rebecca K Golley (RKG) provided supervision throughout the research process, including agreement on results synthesis and interpretation. All authors contributed to reviewing, editing, and approving the final version of the paper.

7.2 Abstract

Introduction: Monitoring and promoting children's health behaviours including dietary intake, physical activity, sedentary behaviour and sleep is a key responsibility for Primary Health Care (PHC). Practical tools to support PHC practitioners to screen child health behaviours are lacking. This project aims to understand caregiver acceptability and feasibility of a child health behaviour screening tool within an Australian PHC clinic.

Methods: Caregivers of children aged 6-months to 5 years attending a multidisciplinary PHC clinic were invited to complete a brief electronic health behaviour screening tool in the waiting room prior to their child's appointment. Caregivers completed an acceptability survey before and after completing the screening tool, using Likert-scale responses. Caregivers were subsequently invited to participate in a virtual interview to discuss their perspectives further. Qualitative data from interviews were descriptively analysed.

Results: Thirty-nine caregivers completed the screening tool and acceptability surveys. Caregivers indicated comfort and confidence to complete the screening tool and indicated suitability of screening in PHC. Overall, caregivers liked the tool, found it easy to complete, and indicated a willingness to regularly monitor their child's health behaviours. Caregivers also indicated comfort, confidence and helpfulness of the tool to inform health behaviour focused conversations with their practitioner. Caregivers expressed unique preferences for receiving results, resources and supports following screening.

Conclusion: Our findings demonstrate child health behaviour screening is acceptable to caregivers and completion is feasible in a PHC setting. This research provides proof-of-concept evidence, with future research required to investigate the effectiveness of child health behaviour screening within routine PHC to support health behaviour conversations and the provision of tailored advice, resources and referral pathways to support children's growth, health, and development.

Keywords: Screening, Primary Health Care, Tool development, health promotion

7.3 Introduction

The first five years of life is a critical stage of growth, development, and lays the foundation for lifelong health and wellbeing [24, 42]. During this time, children's health behaviours are established, including their dietary patterns, physical activity and sedentary behaviours and sleep habits [24, 25, 55, 97, 178]. These key modifiable health behaviours can track into adolescence and adulthood, and therefore have influence health across the life course [32, 33]. Primary Health Care (PHC) is a familiar and valued setting for caregivers of young children due to the longitudinal and trusting relationships developed from regular encounters. PHC reaches caregivers predominately through routine health checks and immunisation appointments in general practice settings, as well as multidisciplinary allied health and children and family health services [72, 91]. PHC is therefore essential for achieving a multidisciplinary, holistic, and universal approach to health and is an ideal and opportunistic setting for early intervention and health promotion to support optimal growth, health, and development in the early years.

Current recommended practice in PHC is based predominately on growth monitoring [97, 158], however there are several limitations to this approach, limiting its effectiveness and its acceptability to both practitioners and caregivers [100, 111, 113, 114]. National policies have highlighted the importance of shifting the focus from weight-based measures of health to focussing on health behaviours. Reviews of national PHC guidelines demonstrated that monitoring and promoting children's health behaviours is recommended in PHC, however there is a lack of practical tools and resources to support practitioners to conduct this in practice [79, 242]. Existing screening tools have been identified and described in international systematic reviews, highlighting a lack of brief tools that comprehensively measure all four child health behaviour domains and are suitable for an Australian PHC context [125, 126, 183]. Brief tools have previously been defined as <15 items [125], however this definition has been reconsidered, particularly if a tool is to measure across multiple domains.

Understanding the perspectives of key partners is essential to supporting the acceptability, reach and uptake of a new practice. Practitioner perspectives on monitoring and promoting children's health behaviours in PHC have been captured through collaborative co-design and consensus processes [230, 232, 233, 243]. Brief and practical screening tools that are easy to complete and provide clear courses of action following screening are wanted [232, 243]. Child health behaviour screening has potential as a universal and equitable approach to child preventive health care in

PHC, overcoming barriers to current practice. Caregiver perspectives have been explored internationally [230], however are not known in an Australian context.

7.4 Aim & Objectives

Aim: The aim of this study is to determine caregiver acceptability and feasibility of child health behaviour screening within a PHC setting, including perspectives on a child health behaviour screening tool, and caregiver needs for resources and supports following screening.

Objectives:

1. Develop a fit-for-purpose child health behaviour screening tool
2. Understand caregiver acceptability of child health behaviour screening as an approach
3. Understand caregiver acceptability of a specific child health behaviour screening tool
4. Understand caregiver acceptability of using child health behaviour screening as a prompt to initiate health behaviour focused conversations with a PHC practitioner
5. Understand caregiver needs for resources and supports following child health behaviour screening
6. Understand feasibility of child health behaviour screening in a PHC setting

7.5 Methods

7.5.1 Study design

Multi-method acceptability and feasibility study. Reporting follows the Consolidated Standards of Reporting Trials (CONSORT) 2010 statement: extension to randomised pilot and feasibility trials [155]. See Appendix 16 for reporting checklist.

Ethics approval was obtained from the Flinders University Human Research Ethics Committee (HREC 7220; Appendix 17).

7.5.2 Eligibility and sample size

Caregivers of children aged 6 months to 5 years attending the Flinders Health2Go clinic, a multidisciplinary PHC clinic located within the College of Nursing and Health Sciences at Flinders University in South Australia, were eligible to participate. Caregivers of children aged younger than 6 months, or older than 5 years were not eligible to participate. Caregivers unable to provide informed consent were not eligible to participate.

Health2Go provides student-led and student-embedded multidisciplinary allied health and nursing services to children and their families in Southern Adelaide. Services include paediatric nursing, dietetics, occupational therapy, speech pathology and physiotherapy. These services are delivered by Flinders University allied health students, with direct supervision from experienced clinicians and clinical educators. Children access Health2Go services for developmental, language, feeding and/or speech concerns.

The first author organised meetings with the Health2Go Business Manager and Flinders University Teaching Specialists prior to the study to gain insight into the children and families who attend Health2Go and ensure the appropriateness of the study methods including recruitment and data collection procedures. It was understood that approximately 30-40 children and their caregivers attend Health2Go for various allied health services across an 8–10-week therapy block. This was used to estimate a sample size of 30-40 caregivers for the study.

7.5.3 Development of the Child Health Behaviour Screening Tool

The development of the Child Health Behaviour Screening tool was informed by results of Nominal Group Technique (NGT) workshops conducted between October 2023 to March 2024 with South Australian PHC practitioners (presented in Chapter 6). NGT workshops identified key features to include in a child health behaviour screening tool and the supports needed to implement child health behaviour screening in PHC. Two existing validated brief screening tools, one for child dietary intake [244] and one for movement behaviours [245] were combined and adapted using the NGT workshop findings to ensure the tool was suitable for the Australian PHC context. The existing valid and reliable brief tools were developed using a rigorous approach including systematic reviews [125, 246] and extensive cognitive interviewing [247-249], however measured separate health domains, and had not yet been tested in an Australian PHC setting.

An electronic version of the Child Health Behaviour Screening tool was created using Research Electronic Data Capture (REDCap), an online survey and database software, to allow caregivers to complete the screening tool on an iPad in the Health2Go waiting room. Main adaptations to the tool related to question design and response format, ensuring positive language and framing, and utilising easy multiple choice response options. An additional open-text response option was included at the end of each section, to prompt caregivers to share any concerns they have about their child in relation to each health behaviour. A convenience sample of caregivers (n = 3) were approached to pilot test and provide feedback on the electronic screening tool, prior to study data collection. Feedback related to adding in more visuals and improving the readability of questions.

7.5.4 Data collection

All survey data were collected via REDCap, , facilitated by the first author. Electronic surveys were completed by caregivers on an iPad at Flinders Health2Go. Individual interviews were conducted virtually via Microsoft Teams and were facilitated by the first author. Student practitioners and clinical educators were not involved in participant recruitment or data collection. Figure 17 demonstrates flow chart of data collection.

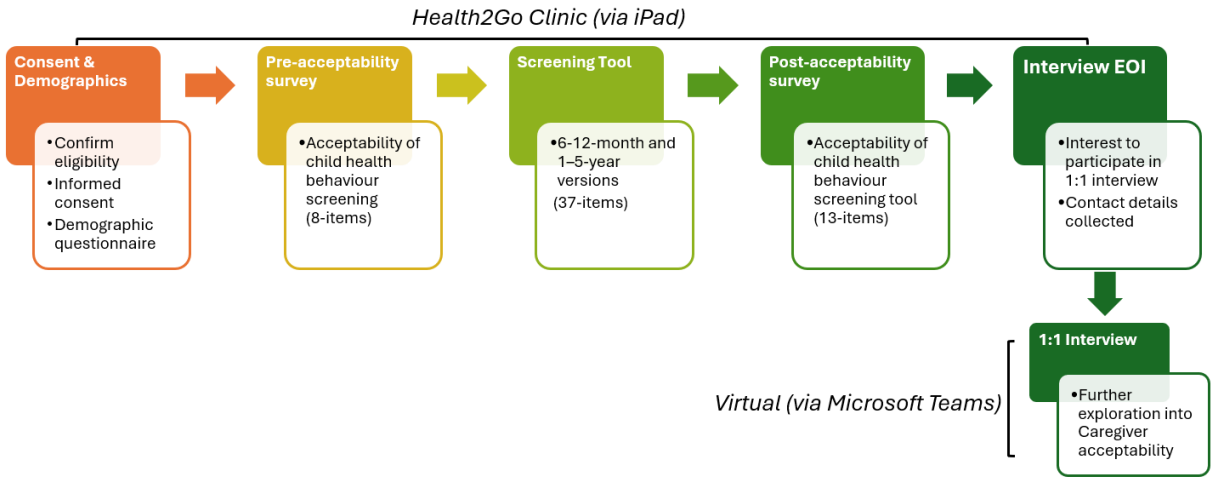


Figure 17: Flow chart of data collection in caregiver acceptability study

7.5.5 Caregiver consent & demographic questionnaire

Caregivers were recruited using convenience and purposeful sampling between June and August 2024 by the first author. See Appendix 18 for recruitment flyer distributed at Health2Go.

The first author attended the Health2Go clinic throughout the therapy block and approached caregivers of children aged 6 months to 5 years in the waiting room prior to their appointment. Caregivers were asked if they were interested in participating in a research study about their child's health behaviours. Caregivers who expressed interest in participating were provided with an iPad that contained an electronic participant information sheet (Appendix 19) and demographic questionnaire (Appendix 20). Informed consent to participate in the study was provided through completion of the demographic questionnaire that included caregiver (age, gender, relationship to child, education level, employment status and postcode) and child (age, gender) characteristics.

7.5.6 Caregiver pre-acceptability survey

Caregivers were then directed to an 8-item pre-acceptability survey (Appendix 21), informed by the "Generic form of the Theoretical Framework of Acceptability (TFA) questionnaire" [250] as well as previous research investigating caregiver acceptability of a child health behaviour screening tool [231] to understand caregiver acceptability of child health behaviour screening in primary health care. Response options were on a 5-point Likert scale ranging from negative sentiment (1) to positive sentiment (5), where 3 was a neutral response.

Questions aimed to understand caregivers perceived comfort and confidence to screen their child's health behaviours as well as the suitable of screening to PHC. Caregivers were also asked for the perceived helpfulness of child health behaviour screening to inform health behaviour focused conversations with their PHC practitioner, as well as their comfort and confidence to discuss their child's health behaviours with a PHC practitioner after screening.

7.5.7 Child Health Behaviour Screening Tool

The Child Health Behaviour Screening tool is a 37-item parent administered screening tool for children aged 6 months to 5 years. As the national recommendations for health behaviours vary by age [30, 31, 57], there are two versions of the tool for ages 6-12months and 1-5 years. The Child Health Behaviour Screening tool is intended to be completed in the waiting room of a PHC clinic prior to an appointment and inform health behaviour focused conversations between caregivers and PHC practitioners within the appointment. The screening tool includes questions regarding the child's dietary intake, movement (i.e. rolling, tummy time, active play, and physical activity), sedentary behaviour (i.e. screen time), and sleep. See Figure 18 to Figure 21 for example images demonstrating the iPad view of the Child Health Behaviour Screening Tool 1-5 years. Full details of the Child Health Behaviour Screening Tool are shown in Appendix 22 (6–12 month version) and Appendix 23 (1–5 year version).

After completing the child health behaviour screening tool, caregivers were able to provide their email address if they wished to receive a copy of their responses. An auto-generated REDCap email was sent to caregivers which included their responses as well as educational resources regarding child health behaviours (Figure 22) and links to evidence-based websites and resources (Figure 23). The research team did not have access to these emails to ensure caregiver confidentiality. Caregivers were encouraged to discuss any concerns they had about their child's health behaviours with their PHC practitioner.

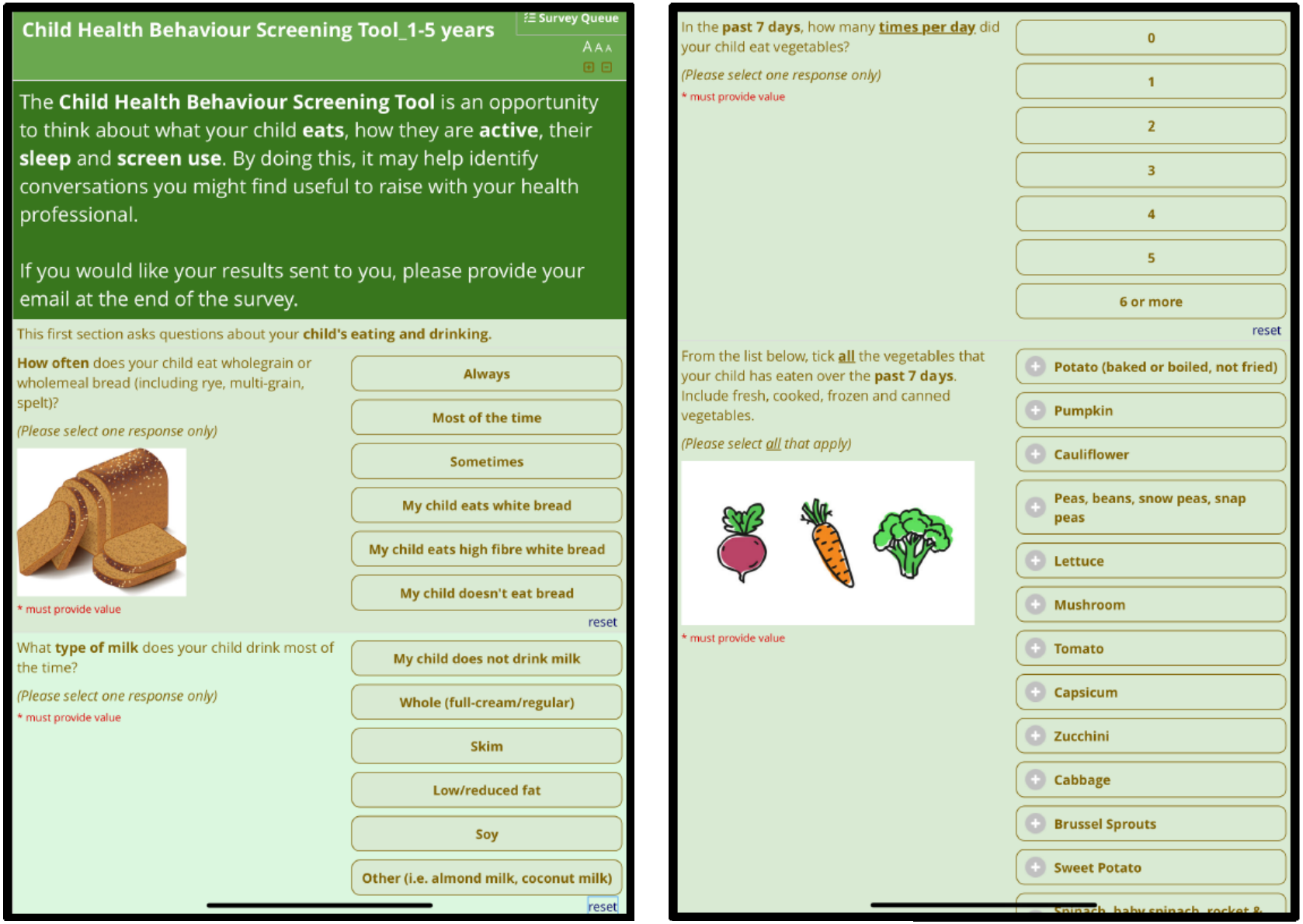


Figure 18: Child Health Behaviour Screening Tool 1-5 years (iPad view, example screen 1 & 2)

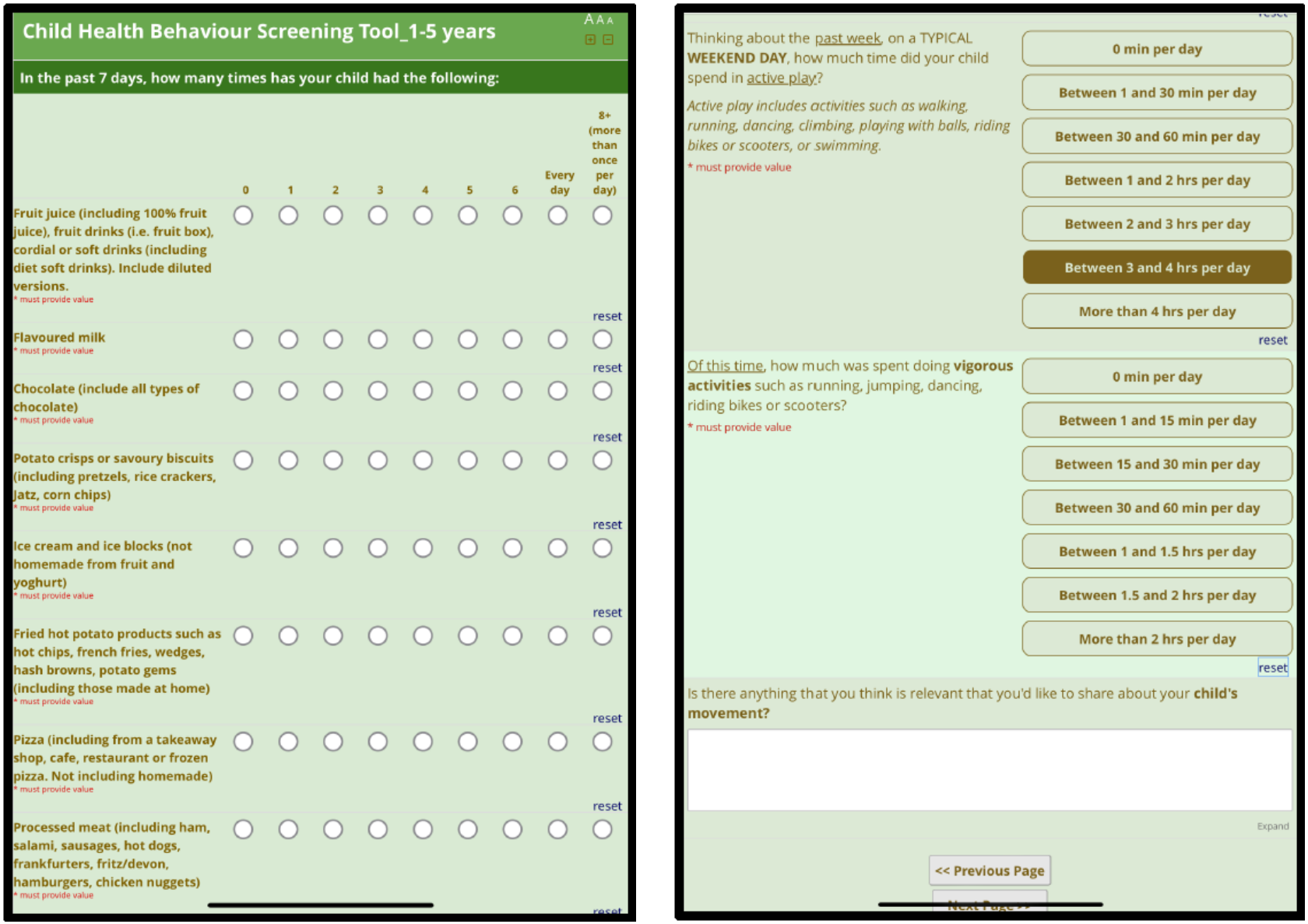
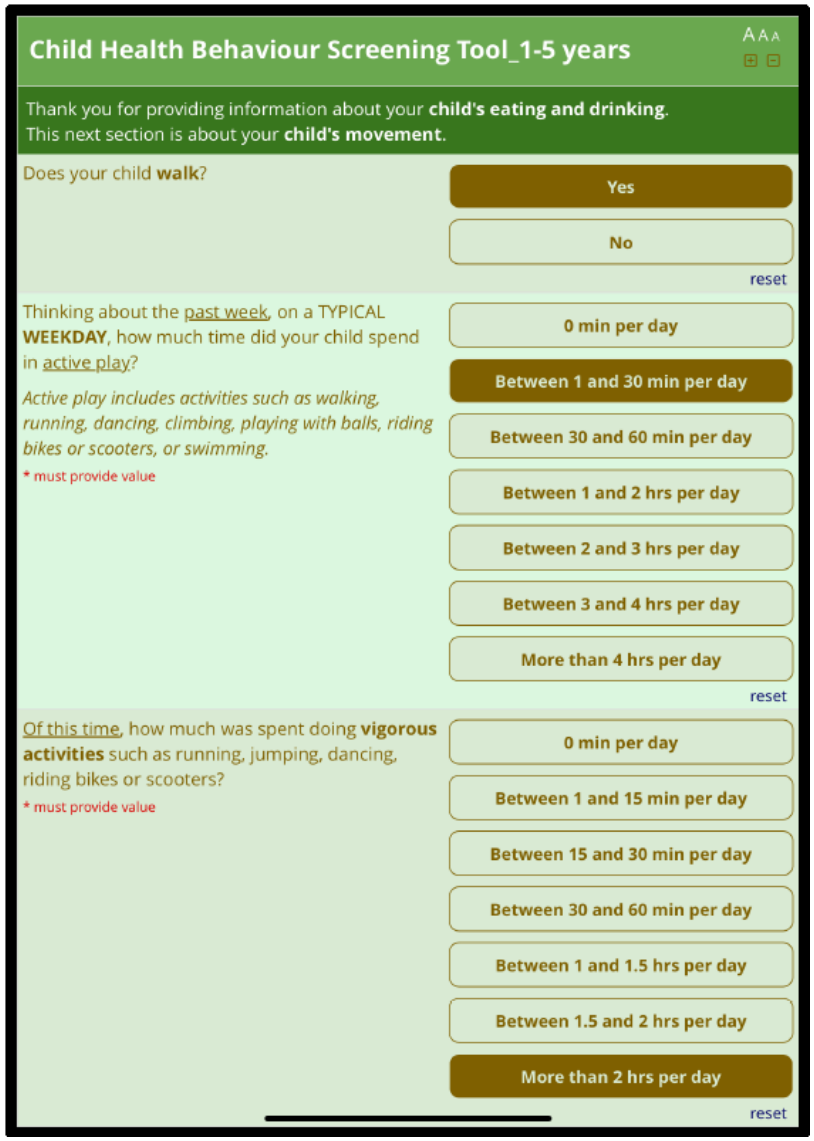


Figure 19: Child Health Behaviour Screening Tool 1-5 years (iPad view, example screen 3 & 4



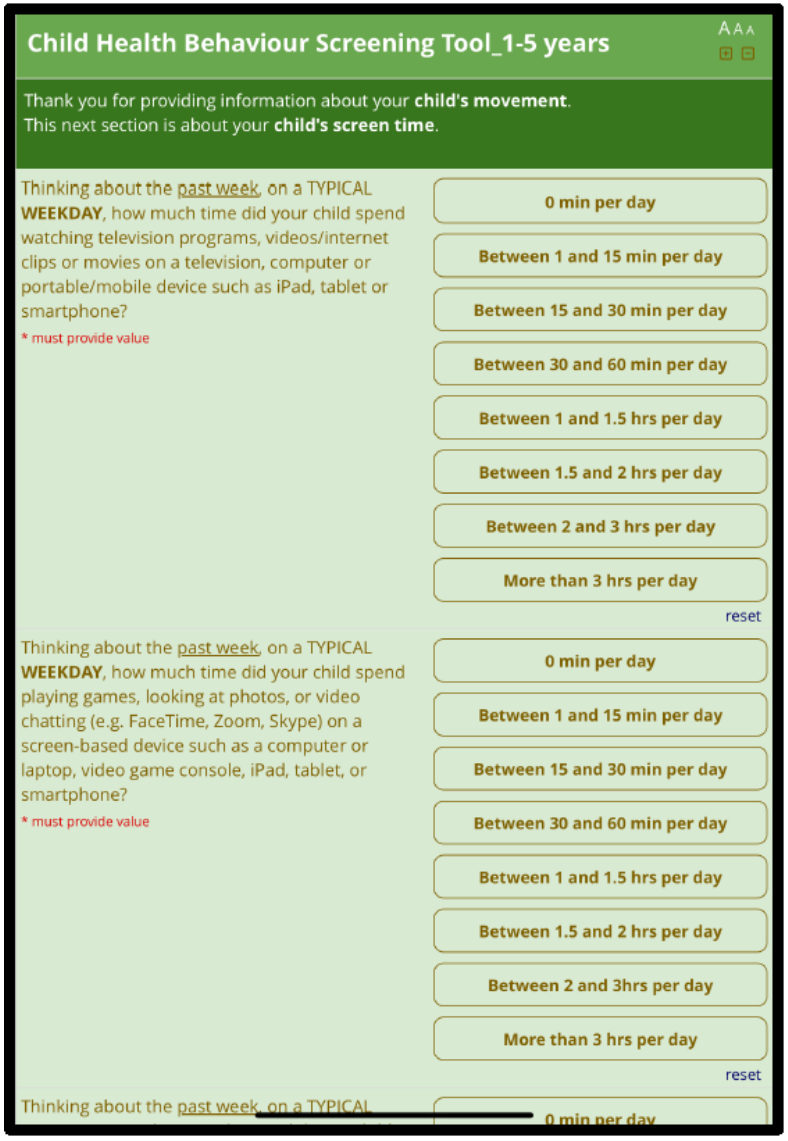


Figure 20: Child Health Behaviour Screening Tool 1-5 years (iPad view, example screen 5 & 6)

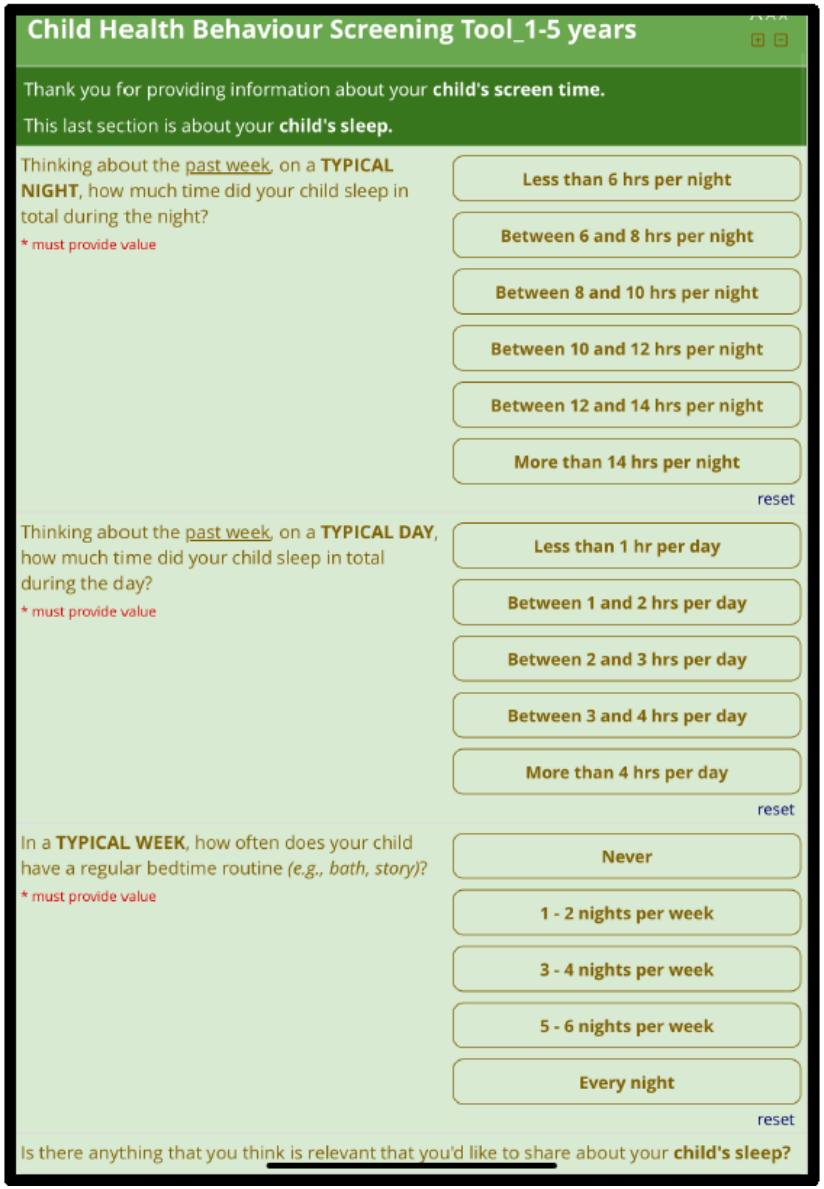


Figure 21: Child Health Behaviour Screening Tool 1-5 years (iPad view, example screen 7)

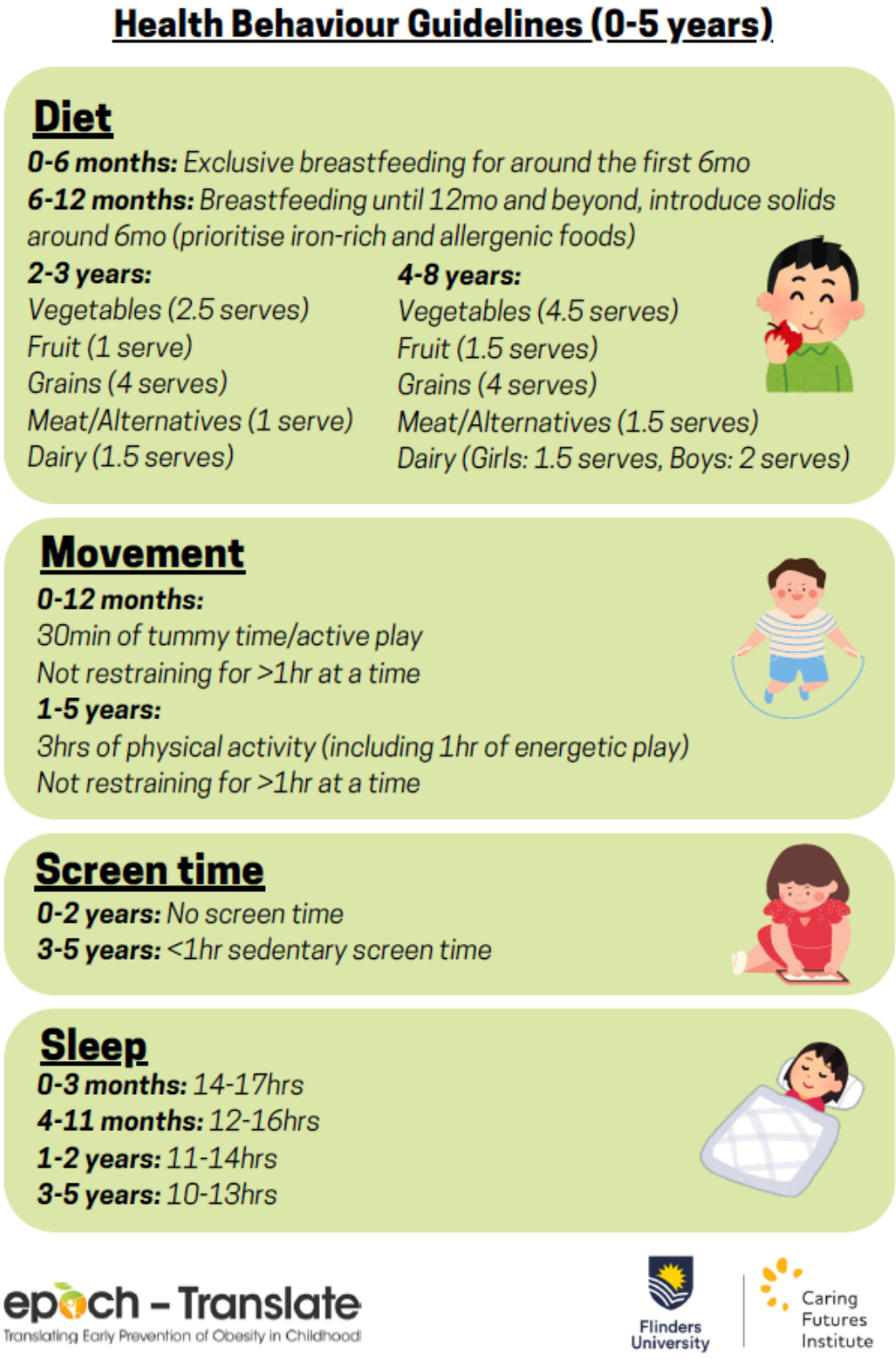


Figure 22: Summary of health behaviour guidelines provided to caregivers

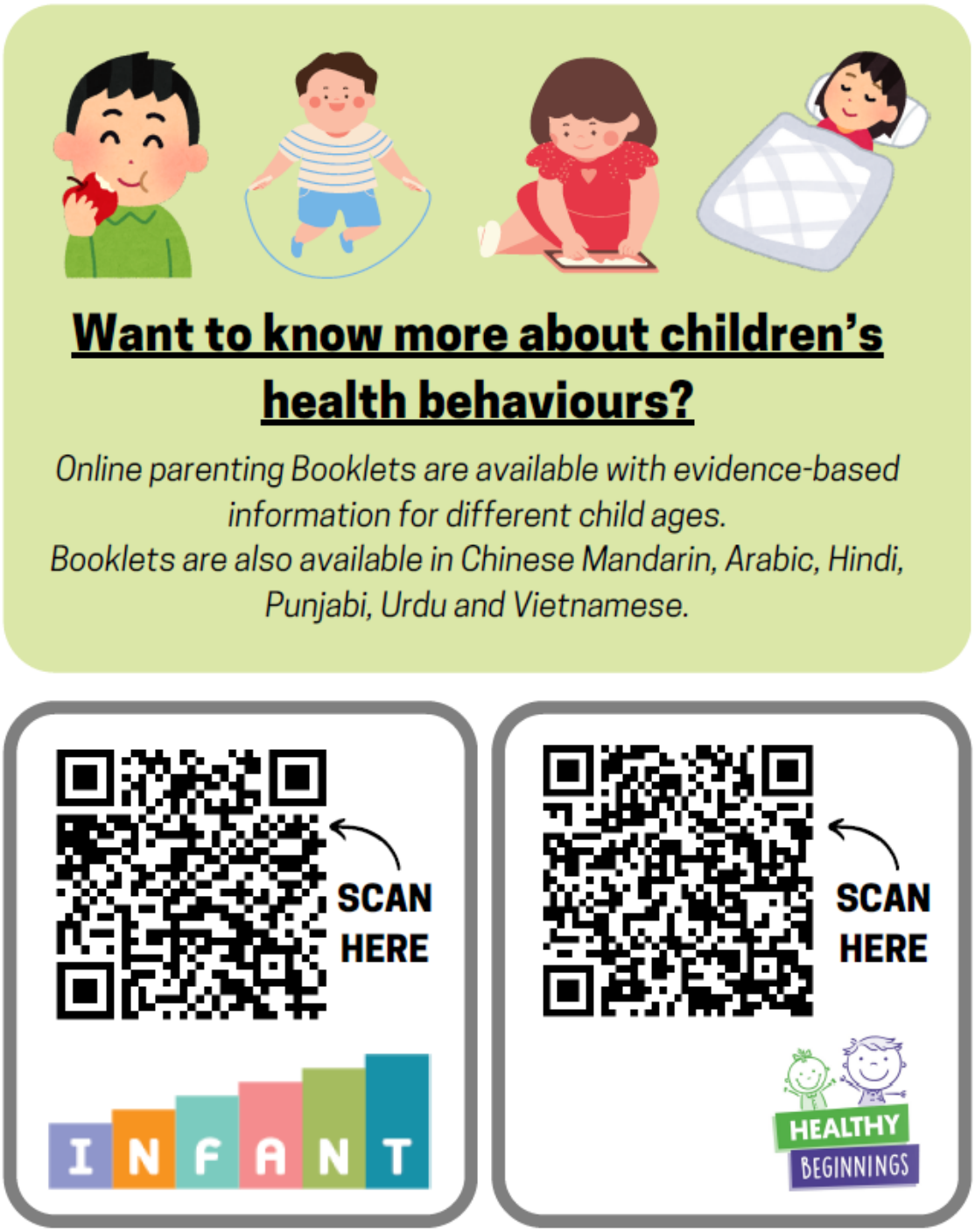


Figure 23: Infographic provided to caregivers to access further information on child health behaviours

7.5.8 Caregiver post-acceptability survey

After completing the child health behaviour screening tool caregivers were asked to complete a 13-item post-acceptability survey (Appendix 24). Questions were similar to the pre-acceptability survey, informed by previous research [231, 250], however the post-acceptability survey aimed to understand caregiver acceptability of the Child Health Behaviour Screening Tool specifically. Response options were on a 5-point Likert scale ranging from negative sentiment (1) to positive sentiment (5), where 3 was a neutral response.

Questions aimed to understand caregivers likability of the tool, perceived comfort and confidence to complete the screening tool, completion ease, ease and clarity of tool questions, suitability of tool completion time, perceived suitability/compatibility of the child health behaviour screening tool to PHC. Caregivers were also asked for the perceived helpfulness of the child health behaviour screening tool to inform health behaviour focused conversations with their PHC practitioner, as well as their comfort and confidence to discuss their child's health behaviours with a PHC practitioner after completing the tool. Caregivers were also asked to indicate their preference for receiving screening tool results, resources and supports after screening and their views on the tool name.

7.5.9 Caregiver Interviews

Caregivers were subsequently invited express their interest and availability to participate in a virtual interview to explore their perspectives further (Appendix 25). Caregivers who expressed interest were contacted via their preferred contact method (email or phone) to book a virtual interview. Individual interviews were held virtually via Microsoft Teams during July and August 2024. Semi-structured interviews asked caregivers perspectives on child health behaviour screening as a preventive activity in PHC, feedback on the tool they completed in Health2Go, their perspectives on initiating a health behaviour focused conversations with their practitioner and their views on resources and supports needed following child health behaviour screening. The semi-structured interview guide was based on the pre- and post-acceptability surveys, allowing caregivers to openly respond and share their perspectives. See Appendix 26 for the semi-structured interview guide. Interviews lasted 18-32 minutes and were conducted by the first author (DD).

7.5.10 Data analysis

Demographic characteristics for both caregivers and children were analysed using descriptive statistics including mean and standard deviation (SD) for continuous variables and N(%) for categorical variables. Postcode data was used to calculate Socio-Economic Indexes for Areas (SEIFA) indicating relative socio-economic disadvantage. A low index score indicates relatively greater disadvantage, and high index score indicates a relatively lack of disadvantage.

Likert scale responses from caregiver acceptability pre- and post- surveys were analysed using descriptive statistics including median and interquartile range. Wilcoxon Signed-Rank Tests were used to assess changes in caregivers' perceived comfort, confidence and compatibility of child health behaviour screening in PHC pre- and post-intervention. Quantitative statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) Version 28.0 [251]. As this was exploratory research to descriptively understand caregiver experiences, apriori definitions of acceptability and feasibility were not set.

Virtual semi-structured interviews with caregivers were audio-recorded and transcribed using Microsoft Teams, which was then checked by the research team. Descriptive qualitative analysis of interview data was conducted, and then matched to the quantitative survey findings.

7.6 Results

Survey responses are supplemented with interview results.

7.6.1 Participants

Forty-five parents were invited to participate in the study, agreed, and provided informed consent. After excluding incomplete questionnaires, 39 questionnaires were included in analysis (87% response rate). Table 27 presents a summary of caregiver and child demographic characteristics that attended Flinders Health2Go Clinic and had complete data.

Participating caregivers included mostly mothers (n = 30) and had a mean age of 36.1 years (SD 7.4). Majority of caregivers had some (n = 6) or completed (n = 22) tertiary education or a higher degree (n = 3), and were employed in a part-time (n = 21) or full-time (n = 8) capacity. Children were mostly boys (n = 28) and aged 2 years or older (n = 34).

Table 27: Caregiver and child demographic characteristics (n = 39)

	Survey participants (n = 39)	**Interview participants** (n = 4)
Caregiver characteristics	**N**	**N**
Relationship to child		
Mother	30	2
Father	7	2
Relative	2	0
Age (years), mean (SD)*	36.1 (7.4)	N/A
Gender		
Woman	31	2
Man	8	2
Education level		
Did not complete high school	2	0
Completed high school	6	0
Some tertiary education (University or TAFE)	6	2
Completed tertiary education	22	2

Higher degree (Masters or PhD)	3	0
Employment status		
Employed full-time (38+hrs/week)	8	2
Employed part time (<38hrs/week)	21	1
Employed casually	2	0
Not currently employed outside the home	7	1
Student	1	0
SEIFA**		
Lowest quintile	3	0
Second quintile	14	2
Third quintile	2	0
Fourth quintile	6	0
Highest quintile	14	2
	Survey participants (n = 39)	**Interview participants** (n = 4)
Child characteristics	**N**	**N**
Age		
4-11 months	1	0
12-23 months	4	1
2 years	5	1
3 years	10	1
4 years	19	1
Gender		
Girl	11	1
Boy	28	3

**n = 38 survey participants provided caregiver age, n = 3 interview participants provided caregiver age (29, 37 and 40 years)*

***SEIFA, Socio-Economic Indexes for Areas Index of Relative Socio-Economic Disadvantage – low index score indicates relatively greater disadvantage, high index score indicates a relative lack of disadvantage.*

7.6.2 Caregiver acceptability and feasibility of child health behaviour screening

Table 28 describes caregiver acceptability of child health behaviour screening, pre- and post-screening tool completion. Caregivers reporting levels of comfort (4 – 5) increased from 28 in the pre-acceptability survey, to 39 post-acceptability survey ($W = 133$, $Z = 2.729$, $p = 0.006$, $r = 0.437$). Six caregivers indicated low confidence (1 – 2) in the pre-acceptability survey, with all caregivers indicating a neutral (n = 1) or confidence (n = 38) in the post acceptability survey. Twenty-eight caregivers indicated suitability of child health behaviour screening in PHC (4 – 5) in the pre-acceptability survey, compared to 33 in the post-acceptability survey.

When asked if caregivers would be willing to monitor their child's health behaviours with their PHC practitioner, most caregivers agreed or strongly agreed (n = 36). Thirty caregivers liked or strongly liked (4 – 5) the child health behaviour screening tool. Thirty-eight caregivers indicated the tool was easy or very easy (4 – 5) to complete and agreed or strongly agreed (4 – 5) that the tool questions were clear and easy to understand. All caregivers agreed or strongly agreed (4 – 5) that the amount of time to complete the screening tool was suitable (n = 39).

Table 28: Caregivers responses to pre-acceptability and post-acceptability survey (n = 39)

Pre-acceptability survey*			Post-acceptability survey*			Wilcoxon Signed-Ranked Test			
Item	**N**	**Median (IQR)**	**Item**	**N**	**Median (IQR)**	**Test statistic (W)**	**Standardised test statistic (Z)**	**Effect size (r)**	**p-value**
Comfort		4 (1 – 5)	**Comfort**		4 (4 – 5)	133.000	2.729	0.437	**0.006**
1 - 2	10		**1 - 2**	0					
3	1		**3**	0					
4 - 5	28		**4 - 5**	39					
Confidence		4 (4 – 5)	**Confidence**		4 (4 – 5)	73.500	1.359	0.218	0.174
1 - 2	6		**1 - 2**	0					
3	0		**3**	1					
4 - 5	33		**4 - 5**	38					
Suitability for PHC		4 (3 – 4)	**Suitability for PHC**		4 (4 – 4)	67.500	1.069	0.171	0.285
1 - 2	0		**1 - 2**	0					
3	11		**3**	6					
4 - 5	28		**4 - 5**	33					

**Response options ranged from 1 (negative sentiment) to 5 (positive sentiment), where 3 was a neutral response*

Of the 45 caregivers approached, 42 completed the screening tool, indicating a 93% tool completion rate. Average time to complete the tool was 3 minutes, 52 seconds (range 2.5 - 13 minutes) demonstrating feasibility to be completed in a PHC waiting room prior to an appointment.

> “because it's, you know, it can be done on the phone or tablet, whatever, it's quick and easy” (Father #1)

Most caregivers indicated a preference to monitor child health behaviours during child health checks (n = 25), followed by annually (n = 8) and opportunistically (n = 6).

> “if you choose to go through the maternal health, you know, like CaFHS 'cause, they're kind of the ages that you start thinking about the kids growth and how they're going. Yeah. You know, whether that's every six months till they're three and then yearly from there or.” (Mother #1)

> “I reckon it would need to be done multiple times….because obviously in winter you're going to have a lot of different answers to summer in regards to how much time you spend outside, fruit and the foods that they eat” (Father #1)

> “Well, I think actually doing the screening tool at the same time as those checks would be beneficial because you have both sets of data then and then you are actually able to find correlations between the food at the exact time that the all the other growths are being measured. So you've got both data sets at once.” (Mother #2)

> “Like it's when they're doing their needles or something like that. Like you've got set frequencies where they're in there anyway and they're not sick” (Mother #2)

Caregivers were able to select all screening tool names they found acceptable. Most caregivers identified “Child Health Behaviour Screening” an acceptable name (n = 22). Fifteen caregivers found “Diet, Movement and Sleep Screening” and “Health and Development Screening” to be an acceptable tool name. “Healthy Habits Screening” and “Lifestyle Screening” was deemed acceptable by 14 and 13 caregivers, respectively. No caregivers listed other screening tool names in the free text response box provided.

> “I probably wouldn't want to have the “healthy” in there 'cause that makes it sound like if you're not doing the right thing on this, they're not healthy.” (Father #1)

> “I kind of thought a little bit when it was health behaviour tool it might be into like triggers for like autism or ADHD or things like that or things that may not necessarily be a little bit a little bit neurodivergent.” (Mother #2)

Table 29 describes caregiver acceptability of child health behaviour screening as a prompt to initiate health behaviour focussed conversations with a PHC practitioner, pre- and post-screening tool completion.

When asked if screening would help inform health behaviour focussed conversations with their PHC practitioner, thirty-eight caregivers agreed or strongly agreed (4 – 5) in the pre-acceptability survey. In the post-acceptability questionnaire thirty-six caregivers agreed or strongly agreed (4 – 5) and one caregiver disagreed (2).

All caregivers (n = 39) indicated comfort (4 – 5) in the pre-acceptability survey, with one caregiver indicating a neutral (3) and thirty-eight caregivers indicating comfort (4 – 5) in the post-acceptability survey. Thirty-seven caregivers indicated confidence (4 – 5) in the pre-acceptability survey, with all caregivers (n = 39) indicating confidence (4 – 5) in the post-acceptability survey.

> “Sometimes we forget everything. You know. We don't know how what to say to the doctor if that questions in my mind, I can tell like more idea about that things so that. I know the problem with my child.” (Father #2)

> “Whereas it's like if they could have those deeper conversations and they might be able to find other ways that you could improve.” (Mother #1)

> “I feel like they touch on it a little bit like with the GP, or with like the maternal health nurses and stuff. But I feel like it's not in depth. It's kind of like a tick a box like you know, whereas I think your questions are a bit more…reflective and a bit more going into depth around it. which yeah, shows. I guess it shows more of the habits rather than just ticking the box.” (Mother #2)

> “And I definitely think, yeah, like the thing that comes to mind is, yeah, something like the CaFHS setting. Like, I definitely think it would be valuable there. I mean, I've gone through CaFHS before and had bad experiences just 'cause there's a lack in this area, and you try and explain it to them. So without them, actually, they're very tool based and very developmental based I think having a tool like this for the practitioners and the parents to use would just yeah have start be able to start those conversations that need to happen and yeah hopefully pick things up before they’re a bigger issue.” (Mother #2)

Table 29: Caregiver acceptability of using child health behaviour screening as a prompt to initiate health behaviour focussed conversations with a primary health care practitioner (n = 39)

Pre-acceptability Survey*			Post-acceptability Survey*			Wilcoxon Signed-Ranked Test			
Item	**N**	**Median (IQR)**	**Item**	**N**	**Median (IQR)**	**Test statistic (W)**	**Standardised test statistic (Z)**	**Effect size (r)**	**p-value**
Helpfulness		4 (4 – 5)	**Helpfulness**		4 (4 – 4)	19.500	-1.732	-0.277	0.083
1- 2	0		**1- 2**	1					
3	1		**3**	2					
4 - 5	38		**4 - 5**	36					
Comfort		4 (4 – 5)	**Comfort**		4 (4 – 5)	11.000	-1.897	-0.304	0.058
1- 2	0		**1- 2**	0					
3	0		**3**	1					
4 - 5	39		**4 - 5**	38					
Confidence		4 (4 – 5)	**Confidence**		4 (4 – 5)	27.500	0.000	0	1.000
1- 2	0		**1- 2**	0					
3	2		**3**	0					
4 - 5	37		**4 - 5**	39					
**Response options ranged from 1 (negative sentiment) to 5 (positive sentiment), where 3 was a neutral response*									

7.6.3 Caregiver identified needs for resources and supports following screening

Caregivers (n = 39) indicated their preference for receiving screening tool results (Figure 24) and were able to select more than one response. Fourteen caregivers described their preference to receive a high-level summary of screening tool results. Caregivers indicated their preference for specific results or visual summary of results to be compared to guidelines/recommendations. Nine caregivers indicated that they would not like to receive screening tool results, whilst ten caregivers indicated that they would like their health care practitioner to receive screening tool results. Of the caregivers that indicated they would not like to receive the results (n = 9), three caregivers indicated they would like their health care practitioner to receive the results.

> *"I definitely do like the visual thing, whether it's, you know, like charts or like quick graphs or something. So it's just like you can, you know, you can see your chart, and you can see the recommendation chart is really easy to see like where you are compared to recommendation or something."* (Mother #1)

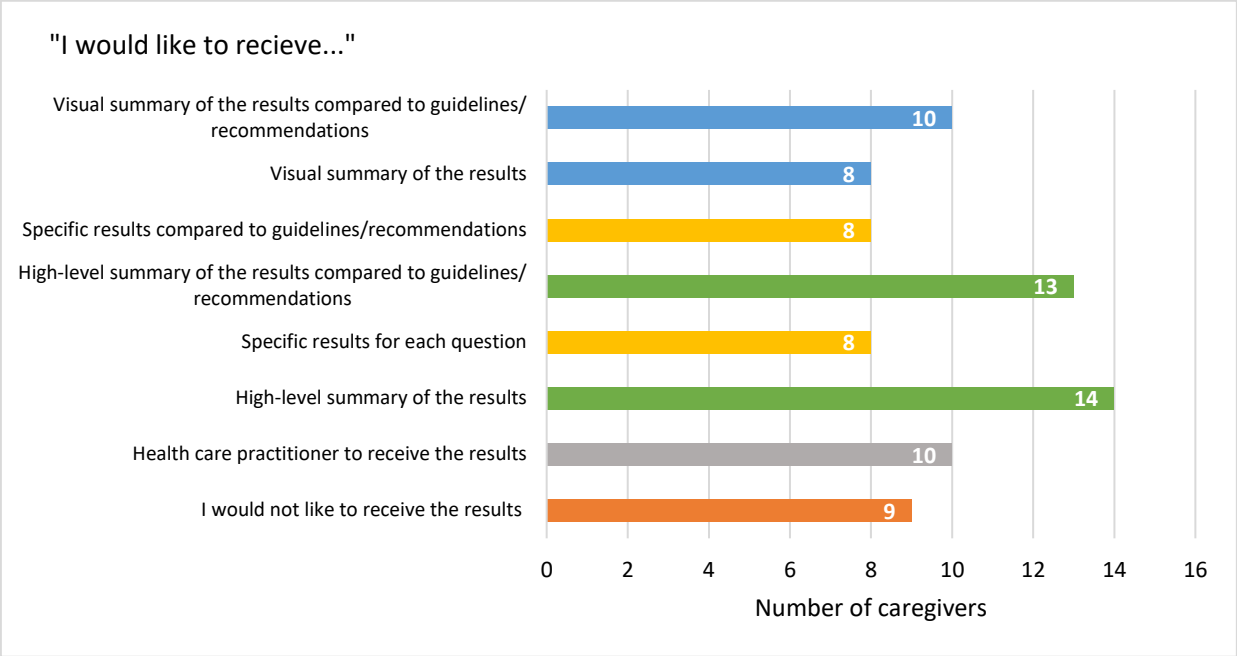


Figure 24: Caregiver preferences for receiving child health behaviour screening tool results (n = 39)

Caregivers (n = 39) also indicated their preference for receiving resources and supports following screening and were able to select more than one response (Figure 25). Caregivers indicated their preference for receiving educational resources on national recommendations for child health behaviours (n = 26), links to trusted websites and organisations (n = 25) and referrals to services and organisations to support their child's health behaviours (n = 21). Educational resources on how to have health behaviour focused conversations with your practitioner were less preferred by caregivers (n = 11). Two caregivers indicated that they did not wish to receive any resources or supports following screening.

> *"The big one's gonna be the links to free stuff because that cost of living"* (Father #1)
>
> *"Yes, if it's on my own language or English is fine. But in English I can understand or in Nepalese of some of the words I can't understand as well. But you know, but in if it is in English, that's fine in you know."* (Father #2)
>
> *"I think just those educational tools really 'cause. It's really gonna flag those parents who just possibly didn't know that these behaviours affect health and, yeah, helpful for them to be able to get that knowledge."* (Mother #1)

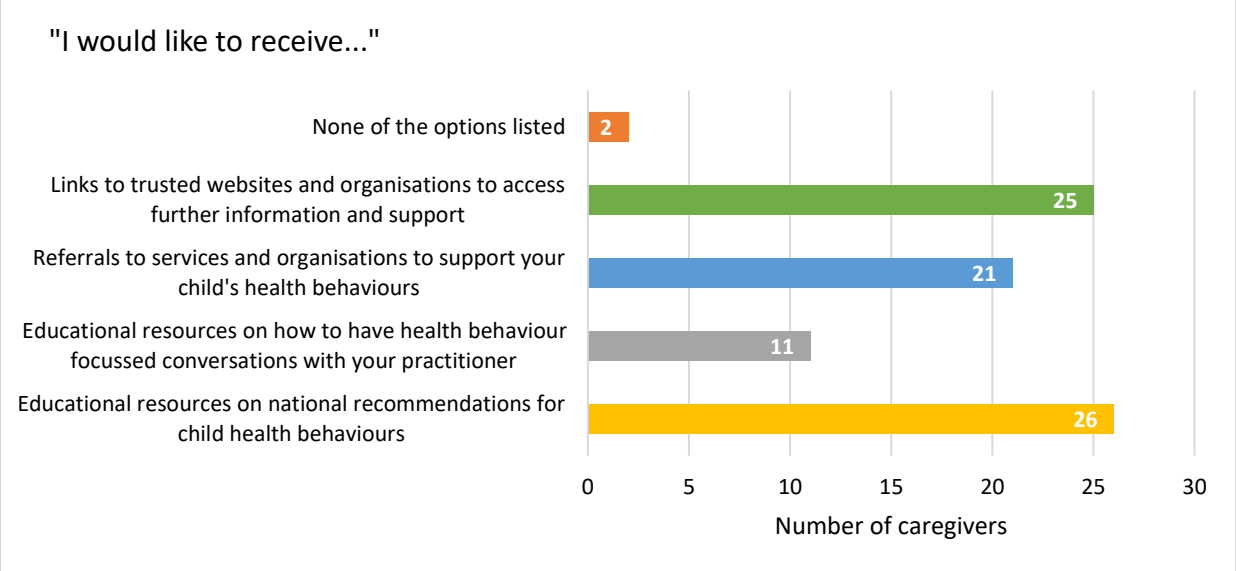


Figure 25: Caregiver preferences for receiving resources and supports following child health behaviour screening (n = 39)

7.7 Discussion

This study aimed to explore Australian caregiver's perspectives of child health behaviour screening in Primary Health Care (PHC). Caregivers indicated that a brief electronic child health behaviour screening tool is acceptable and feasible to complete in the waiting room prior to a PHC appointment. Caregivers expressed unique preferences for receiving screening tool results, resources, and supports following screening, highlighting there is no one-size-fits-all approach. Despite this, caregivers agreed that the tool's purpose was to prompt health behaviour conversations between caregivers and PHC practitioners during a PHC consultation. Our results demonstrate caregiver acceptability and feasibility of a child health behaviour screening tool in PHC, providing proof of concept data for a new way to support children's health, growth, and development in the early years.

Caregivers indicated acceptability and feasibility of child health behaviour screening in PHC, highlighting the importance of tool design and how the tool is administered. Caregivers described the screening tool as easy to complete, with clear and easy-to-understand questions. These tool features have been described in previous literature to support acceptability for both caregivers [126, 230, 231] and PHC practitioners [126, 230, 231, 252]. Caregivers also indicated a willingness to monitor their child's health behaviours during child health checks, highlighting an opportunity to embed child health behaviour screening within routine and universal PHC services. Caregivers also shared their perspectives on the screening tool name, highlighting potential misconceptions regarding the definitions of terms including "healthy" and "behaviour". Consistent with previously captured perspectives of Australian PHC practitioners (presented in Chapter 6), caregivers articulated the importance of clearly describing the tools' purpose and using strengths-based language to avoid misconceptions, and potential shame or stigma.

The time required to complete the tool was another key contributor to caregiver acceptability and feasibility in the present study. Our 37-item child health behaviour screening tool took less than 4 minutes to complete and a had a high completion rate (93%), demonstrating feasibility as a pre-consultation screening tool. Despite previous literature defining brief tools as <15 items [125], all caregivers in this study reported that the time to complete the screening tool was suitable. Our results suggest that completion time might be a more important consideration for defining tool length and suitability in PHC, rather than number of items alone. The child health behaviour screening tool used in the current study was completed electronically to enable

efficient completion and data collection. International literature examining acceptability of developmental screening tools also highlight caregivers' preference for electronic screening tools due to their ease of use and efficiency to complete [253, 254]. However, flexibility in tool administration and completion is critical to meet the needs of diverse caregivers, PHC practitioners, and administration staff suggesting the need for paper-based versions of the tool to also be available [230, 243].

Caregivers indicated their unique preferences for receiving child health behaviour screening tool results, resources, and supports following screening, highlighting there is no one-size-fits-all approach. Whilst many caregivers indicated a preference for high-level or visual results, some caregivers requested detailed results, some did not wish to receive results, and not all caregivers were happy for their PHC practitioner to receive a copy of the results. Previous research with PHC practitioners underscores the need for a multidisciplinary and sector approach to child health behaviour screening, requiring communication and information exchange between practitioners and services [243]. Our results reiterate the importance of tailoring the provision of resources and sharing of screening results to meet family's needs and preferences. Further, a qualitative exploration of child and caregiver perspectives on receiving health feedback called attention to the importance of strengths-based, personalised and age-appropriate language [255]. PHC practitioners have also described the importance of clear courses of action following screening, including resources to support health behaviour conversations and referral pathways [230, 243]. Caregivers in this study indicated a preference for receiving educational resources on health behaviour guidelines and links to trusted websites and organisations. Interestingly, receiving resources on how to have a health behaviour focused conversation with a PHC practitioner was not as important to caregivers, potentially suggesting caregivers believe this to be the practitioner's responsibility.

Our results demonstrate caregivers are accepting of child health behaviour screening as a tool to prompt health behaviour conversations and indicated comfort and confidence to have these conversations with their PHC practitioner. The provision of health promotion advice and anticipatory guidance is an essential component of PHC, however substantial literature highlights the many barriers to providing health promotion advice in practice including a lack of time, out-of-pocket costs for non-bulk-billed services, and limited practitioner knowledge and confidence in how to have health behaviour conversations with caregivers [185, 235]. To meet caregivers desire for consistent, accessible, and affordable health advice and support in PHC [120, 238, 256], there is an urgent need for dedicated time and funding for preventive activities

in PHC, as well as further practitioner education and training [95, 117]. Embedding a child health behaviour screening tool within routine PHC presents an opportunity to better support practitioners' knowledge, confidence, and capacity to screen and promote child health behaviours in practice. Further, the screening tool provides an opportunity for the caregiver to reflect and raise any concerns they might have with their practitioner, facilitating conversations that are individualised and family-centred.

7.7.1 Strengths and considerations

This is the first study to explore caregivers' perspectives of a novel approach to monitoring and promoting children's health behaviours in routine PHC. Strengths of this study include using a multi-method approach to support a deeper understanding of caregiver perspectives. The child health behaviour screening tool used in the study was developed by adapting existing validated screening tools [244, 245] and integrating prioritised features identified by PHC practitioners [243]. The use of convenience sampling in caregiver recruitment is a study limitation. Interpretation of findings and comprehensive qualitative analysis was limited by a small sample size, however the approach for recruitment and data collection was appropriate for a pilot acceptability and feasibility study. Overall, there was a high caregiver response rate, however this might be due to the nature of the PHC clinic as an established setting for undergraduate and postgraduate allied health and nursing student placements. Our results may therefore not be reflective of the response rate and perspectives of caregivers attending other PHC clinics. To minimise data collection and participant burden, detailed caregiver and child demographic data was not captured including country of birth, language spoken at home and Indigenous status. A brief but high-level demographic survey was appropriate. The use of Research Electronic Data Capture (REDCap), an online survey and database software, worked well for data collection in this study. The software was accessible via University platforms, and the research team member who facilitated data collection was familiar with the software and was available to support caregivers if any difficulties navigating the software arose. However, if the screening tool is to be implemented in other settings, the availability and functionality of alternative software may need to be considered.

7.7.2 Implications for future research, policy, and practice

This research provides pilot evidence of feasibility and acceptability of child health behaviour screening in PHC. Our findings can be used to inform adaptations to tool design and implementation strategies for a larger hybrid implementation-effectiveness trial. Future research should explore the effectiveness of child health behaviour screening on improving practitioners knowledge and practice, impact on short and longer-term child health behaviour outcomes, as well as how to implement this approach at scale.

Child health behaviour screening aligns with key Australian preventive health policies, guidelines and services [242] and could complement existing screening tools used in practice for growth and development including the WHO and CDC growth charts [101, 102]. Evidence from future research could inform changes in early childhood health monitoring guidelines to include practical screening tools and resources, helping PHC to prioritise early intervention and health promotion. Ensuring access and availability of child health behaviour screening tools and resources is essential for supporting uptake and use in practice. As an electronic tool, there is potential for it to be made available online, or integrated into electronic medical records, alongside relevant resources and guidelines. Additional electronic tool features could include producing automated result summaries and embedding reminders to prompt completion.

7.8 Conclusion

Monitoring and promoting child health behaviours is a key responsibility of PHC, however there is a lack of tools to support this in practice. This study is the first to explore caregivers' perspectives on this approach, demonstrating that child health behaviour screening is acceptable and feasible to Australian caregivers in PHC. Caregivers are accepting of using the tool to prompt health behaviour focused conversations using a strengths-based approach. Clear courses of action, that can be tailored to family's needs are required. Future research is needed to understand effectiveness of child health behaviour screening and how to implement this approach at scale, alongside updated policy and practice guidelines to support and sustain screening in routine practice. Ultimately, this research provides pilot evidence that child health behaviour screening is acceptable to caregivers as an early intervention and health promotion approach to support children's growth, health, and development in the early years.

7.9 Chapter Summary

This chapter reports the outcomes of a pilot caregiver acceptability study in a multidisciplinary Primary Health Care (PHC) clinic. The findings suggest that child health behaviour screening is feasible and acceptable to caregivers of young children attending PHC. The next chapter provides an overall summary and discussion of the thesis findings and discusses implications for future research, policy, and practice as well as an overview of thesis strengths and considerations.

8 DISCUSSION AND CONCLUSION

8.1 Thesis and Chapter Overview

The aim of this thesis was to determine the feasibility and acceptability of embedding child health behaviour screening within routine Primary Health Care (PHC) as a strategy to support growth, health, and development in the early years (birth to five years). The thesis aim was achieved through addressing the following objectives:

1. Understand current Australian practice guidelines for PHC that provide recommendations for the monitoring and promotion of child health behaviours in the early years (Chapter 4, Study 1)
2. Identify and describe the effectiveness, acceptability and feasibility of child health behaviour screening tools used in PHC settings (Chapter 5, Study 2)
3. Identify and prioritise PHC practitioner generated tool features and supports to implement and embed child health behaviour screening in PHC (Chapter 6, Study 3)
4. Understand caregiver perspectives, experiences, and acceptability of child health behaviour screening within PHC (Chapter 7, Study 4)
5. Develop and test a proof-of-concept child health behaviour screening tool for use in PHC (Chapter 7, Study 4)

Chapter 2 provided an overview of the existing literature while Chapter 3 described the methodological and theoretical approach to achieve the thesis aim and objectives. Each of the study chapters (Chapter 4 – 7) discussed the findings of the relevant thesis objective in isolation.

This final chapter provides a summary and discussion of the overall thesis findings, before presenting recommendations for future research directions and summarising strengths and considerations of the thesis. Section 8.2 summarises the thesis rationale and aim. Section 8.3 summarises the key findings from the thesis and original contributions to knowledge. Section 8.4 provides a discussion of the consolidated findings and comparisons with the current evidence base. Implications for policy, practice, and research are outlined in Section 8.5 while section 8.6 provides a summary of the thesis strengths and considerations. Section 8.7 concludes this chapter and thus, the thesis.

8.2 Summary of thesis rationale and aims

Supporting children's health behaviours including their dietary intake, physical activity, sedentary behaviour, and sleep is crucial for optimal growth, health, and development in the early years. Only 28% of Australian children aged 2-3 years are meeting recommendations for fruit and vegetable intake [58, 59] and only 17% of Australian children aged 2-5 years are meeting recommendations for physical activity and sedentary behaviour [54]. This illustrates that we are not currently meeting the needs of children and families and there is still room for improvement to children's health behaviours to support optimal child growth, health, and development.

Primary Health Care (PHC) is a trusted and valued setting for caregivers of young children and is therefore an ideal setting for monitoring and promoting children's health behaviours. However, previous literature demonstrates a lack of adequate guidance, support, and resources for PHC practitioners to monitor and promote child health behaviours in practice [79, 242]. To provide appropriate and adequate early intervention and health promotion in PHC, practitioners must be equipped with practical and fit-for-purpose guidelines, resources, and tools to enable monitoring and promotion of child health behaviours in practice. Further, PHC practitioners and caregivers have described challenges and limitations to current weight-focused approaches and the need for non-stigmatising and strengths-based preventive care [111, 114, 119, 120]. Therefore, this highlights the need for an evidence-informed, strengths-based, and non-stigmatising approach to early intervention and health promotion.

Therefore, this thesis aimed to determine the feasibility and acceptability of embedding child health behaviour screening within routine PHC as a strategy to support growth, health, and development in the early years (birth to five years). The thesis aim was achieved by addressing six thesis objectives through a multi-stage research program aligned with the Knowledge to Action (KTA) Framework [23, 143] (Figure 26). This thesis provides pilot evidence of the feasibility and acceptability of child health behaviour screening as a strengths-based and non-stigmatising approach to early intervention and health promotion in PHC. Ultimately, this thesis demonstrates an opportunity to embed child health behaviour screening into PHC guidelines and routine practice, better support PHC guideline adoption and implementation, and ultimately improve early intervention and health promotion in PHC to support children's growth, health, and development in the early years.

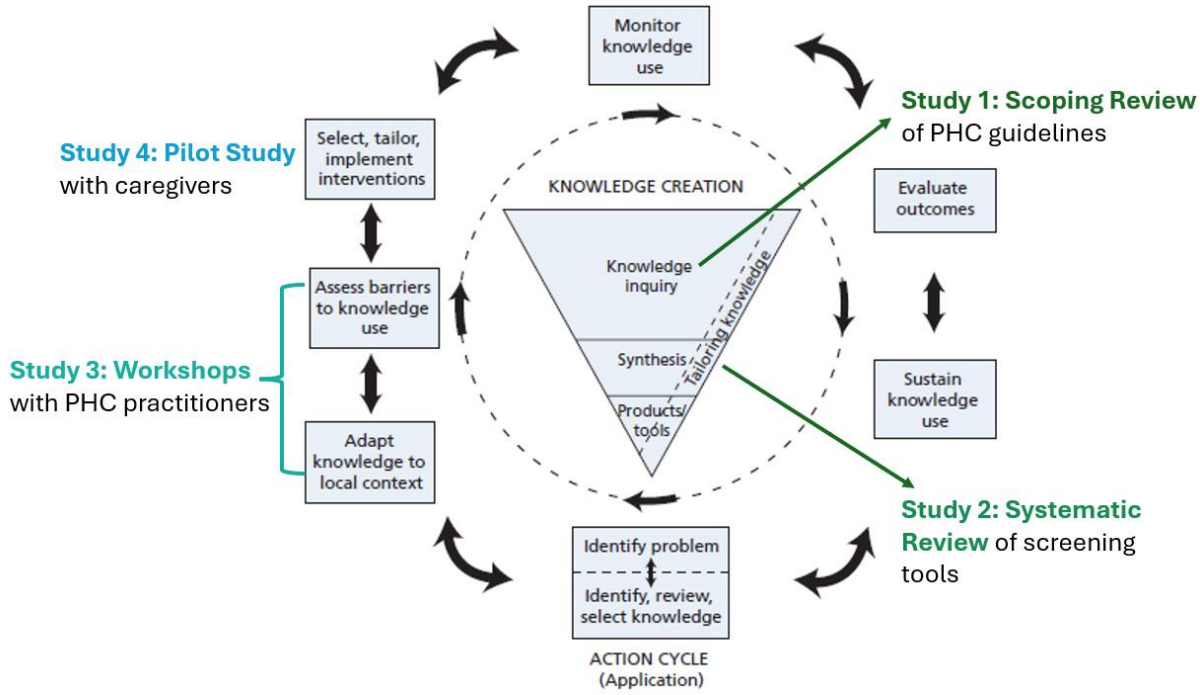


Figure 26: Knowledge to Action (KTA) Framework [23], adapted to demonstrate alignment of thesis studies

8.3 Summary of key thesis findings

Thesis Objective 1: *Understand current Australian practice guidelines for Primary Health Care (PHC) that provide recommendations for the monitoring and promotion of child health behaviours in the early years*

Chapter 4 presented Study 1 to address Thesis Objective 1 which reviewed Australian documents that guide PHC practice and provide recommendations for the monitoring and promotion of child health behaviours in the early years. Eighteen documents met the inclusion criteria including four national, six state/territory and eight practice level documents. A three-stage approach for data analysis and synthesis was conducted. All documents recommended growth monitoring and health promotion advice for dietary intake and at least one other health behaviour domain. Most documents outlined the need to screen child health behaviours, however only two documents provided recommendations to screen across all four health behaviour domains [163, 165]. Within the documents that described screening, recommendations were fragmented and provided limited guidance on how to screen for child health behaviours in practice. Overall, our findings demonstrate that PHC is a recognised and important setting to monitor and promote children's growth and health behaviours. There is, however, a need for the development and integration of evidence-based and practical tools to support screening in routine PHC practice.

Thesis Objective 2: *Identify and describe the effectiveness, acceptability and feasibility of child health behaviour screening tools used in PHC settings*

Chapter 5 presented Study 2 to address Thesis Objective 2 which examined international literature describing child health behaviour screening tools used in PHC settings. Twenty-two studies met the inclusion criteria, describing 14 unique screening tools developed and tested in PHC clinics in the United States, United Kingdom and Canada. Only four screening tools measured all four health behaviour domains [199, 202-205, 209]. Fourteen studies described effectiveness in changing practitioner behaviour, knowledge, and practice including increased rates of screening, counselling, documentation, improved self-efficacy and intention to keep using the tool in the future. Fourteen studies described practitioner views, highlighting practitioners valued screening to enhance their care, and described tool features and logistics which contributed to acceptability. Factors that limited acceptability included the time required for screening, if the tool was difficult to complete, and challenges related to changing practice. Eleven studies described the need for practitioner training, resources, integration into electronic

medical records and administrative support for implementation. Caregivers shared similar views, describing the value in screening, particularly tools that were easy to read and complete. Some caregivers expressed concerns about being judged and the need for recommendations for follow up appointments, ongoing monitoring and practical support. This review highlights a lack of fit-for-purpose screening tools suitable for the Australian PHC context evidencing the need to engage with Australian PHC practitioners to develop a feasible and acceptable tool.

Thesis Objective 3: *Identify and prioritise PHC practitioner generated tool features and supports to implement and embed child health behaviour screening in PHC*

Chapter 6 presented Study 3 to address Thesis Objective 3 which described PHC practitioners' perspectives on child health behaviour screening to inform tool design and implementation strategies identified using Nominal Group Technique (NGT) workshops. Nine workshops were held virtually and were conducted in two rounds, firstly with general practice and allied health practitioners, and secondly with child and family health practitioners. Twenty-nine PHC practitioners described 10 key features of a tool to enable effective use in practice and 10 supports to facilitate implementation. PHC practitioners are accepting of a tool that is easy to complete and provides clear courses of action. Practitioner training and resources were prioritized to support implementation. Overall, practitioners were accepting of the concept of child health behaviour screening in PHC, describing tool features and resources to enable the development of a fit-for-purpose screening tool suitable for the Australian PHC context. However, to support adoption in practice, caregiver acceptability remains an important consideration.

Thesis Objective 4: *Understand caregiver perspectives, experiences, and acceptability of child health behaviour screening within PHC*

Thesis Objective 5: *Develop and test a proof-of-concept child health behaviour screening tool for use in PHC*

Chapter 7 presented Study 4 to address Thesis Objective 4 and 5 which documented the development and pilot testing of a child health behaviour screening tool in a PHC setting. Two existing and validated questionnaires, one measuring diet behaviours [244], and another measuring movement behaviours [245] were combined and adapted using findings from PHC practitioners (Chapter 6) to ensure the tool was suitable for the Australian PHC context.

The child health behaviour screening tool was pilot tested in a mixed methods study conducted in a multidisciplinary PHC clinic with caregivers of children aged six months to five years. Thirty-nine caregivers shared their perspectives on child health behaviour screening before and after completing the pilot screening tool via electronic surveys. Four caregivers participated in a virtual interview to gain a more comprehensive understanding of their perspectives. Caregivers reported high levels of comfort and confidence in completing the screening tool and indicated that the tool was suitable for PHC. Caregivers also indicated that they liked the tool, found it easy to complete, and found the tool questions clear and easy to understand. All caregivers indicated the time to complete the tool was suitable, with the average time being less than 4 minutes. Caregivers indicated their willingness to monitor and discuss their child's health behaviours with their PHC practitioner, during routine child health checks, annually, or opportunistically. Caregivers also shared their unique preferences for how they would like to receive screening tool results and resources following screening. Overall, we developed a fit-for-purpose child health behaviour screening tool for use in PHC with pilot evidence to demonstrate that it is acceptable and feasible to Australian caregivers.

8.4 Discussion of key findings

Through addressing the five thesis objectives, three key thesis findings are highlighted from this body of work. Firstly, child health behaviour screening aligns with Australian Primary Health Care (PHC) scope of practice, guidelines, and policy (Section 8.4.1). Secondly, there is a need to develop tools and resources to support child health behaviour screening in Australian PHC (Section 8.4.2). Thirdly, child health behaviour screening is feasible and acceptable in an Australian PHC context (Section 8.4.3). The thesis findings have been considered and conceptualised using implementation science literature in Section 8.4.4 to generate potential implementation strategies to embed child health behaviour screening into PHC.

8.4.1 Child health behaviour screening aligns with Australian PHC scope of practice, guidelines, and policy

This thesis provides new knowledge on the alignment of child health behaviour screening with Australian PHC scope of practice, guidelines, and policy. This was achieved by an evidence synthesis of the recommendations and priorities of Australian PHC guidelines and policies.

Previous literature has demonstrated practitioners recognise their role in monitoring and promoting child health behaviours [95, 96, 117] and caregivers desire to receive health behaviour advice in PHC [70, 71, 106, 120, 238, 256]. Findings of this thesis illustrate substantial variability in the comprehensiveness of recommendations within PHC guidelines and a lack of adequate tools and resources to support PHC practitioners to conduct screening in practice [106, 183, 242]. A lack of practical tools impacts PHC practitioner confidence, knowledge, and ability to provide consistent, comprehensive, and evidence-based preventive care to children and families [106, 183]. Further, this can result in PHC practitioners providing conflicting advice, creating concern, distrust, and confusion amongst caregivers.

This thesis provides early evidence to inform how to better support PHC practitioners' confidence, capacity, and ability to routinely and consistently monitor and promote child health behaviours in PHC. Findings from this thesis demonstrate that child health behaviour screening is feasible and acceptable as a strategy to support growth, health, and development in PHC, warranting the need for future research to determine effectiveness and how to implement this approach at scale.

8.4.2 A need to develop tools and resources to support child health behaviour screening in Australian PHC

This thesis demonstrated the need to develop tools and resources for child health behaviour screening in Australian PHC. However, to support uptake and adoption in practice, tools and resources must be acceptable and appropriate for use in PHC. This is especially critical as prior research recognises there are a multitude of barriers to implementing prevention initiatives into PHC [134]. Therefore, this thesis developed a child health behaviour screening tool and identified the resources to support implementation in line with PHC practitioners' needs and perspectives.

Throughout the development process we were able to design a screening tool that acknowledged the common barriers and facilitators of conducting preventive care in PHC, whilst recognising the importance of considering the local Australian PHC context. PHC practitioners described the need for questions to be easy to understand and complete, with opportunity for caregivers to flag concerns about their child's health behaviours. Practitioners emphasised the importance of ensuring the tool utilises language that is non-stigmatising and strengths-based. PHC practitioners also highlighted the importance of describing clear next steps following screening, aligned with the 5A's Framework [97] to allow practitioners to provide tailored advice, support, and referrals to other services.

Key resources and support needs identified by PHC practitioners included training and integration into existing health services and software. This builds on findings from previous work conducted with practitioners in general practice settings [223, 232, 233, 257]. However, this thesis engaged multidisciplinary PHC practitioners, making the findings relevant across various PHC settings. Thus, the child health behaviour screening tool developed in this thesis and recommendations for associated resources and supports are likely to be acceptable and suitable for the broader Australian PHC context.

8.4.3 Child health behaviour screening is feasible and acceptable in Australian PHC

This thesis created new knowledge on the feasibility and acceptability of child health behaviour screening in PHC according to Australian caregivers. After demonstrating alignment with PHC scope and guidelines, and engaging with PHC practitioners to develop a screening tool, this thesis explored caregivers' perspectives on child health behaviour screening in PHC through a multi-method pilot study.

This thesis tested a proof-of-concept child health behaviour screening tool and demonstrated that caregivers are accepting and willing to monitor their child's health behaviours within PHC. Caregivers agreed that screening can prompt health behaviour conversations with their PHC practitioner, providing an opportunity to reflect and flag any concerns, and receive individualised advice and support. Caregivers expressed unique preferences for receiving screening tool results, resources and supports following screening. This thesis does however highlight the need for clear courses of action following screening, including signposting to existing trusted resources and services to cater for diverse caregiver and family needs and preferences.

Key considerations highlighted by caregivers included the importance of using strengths-based and non-stigmatising language and the need for screening to be embedded with current practice to support access and sustainability. Caregivers described child health behaviour screening as an opportunity to enhance current practice, through updating child health records, and integration into routine health checks delivered by general practice and child and family health services. Ultimately, child health behaviour screening has the potential to strengthen the partnership between caregivers and PHC practitioners, through initiating health behaviour conversations and promoting positive behaviour change. Therefore, this thesis demonstrates a novel and acceptable approach to enhance how we monitor and promote child health behaviours in Australian PHC.

8.4.4 How to implement child health behaviour screening into PHC

This thesis has generated new knowledge on the alignment of child health behaviour screening with PHC (Section 8.4.1), the need for tools and resources (Section 8.4.2), and the acceptability and feasibility of a screening tool pilot-tested in PHC (Section 8.4.3). Findings from each study within this thesis have been considered and conceptualized to generate potential implementation strategies to embed child health behaviour screening into PHC. Implementation Science is defined as the *'scientific study of methods to promote the systematic uptake of research findings and other evidence-based practice into routine practice and, hence, to improve the quality and effectiveness of health services'* [9, 10]. Implementation strategies refer to the *'methods or techniques used to enhance the adoption, implementation, and sustainability of a clinical program or practice'* [11]. The Expert Recommendations for Implementing Change (ERIC) study provides a comprehensive list of 73 strategies that can be used in research and practice [258]. Table 30 describes the twenty-six implementation strategies identified in this thesis that will support implementation of child health behaviour screening in PHC.

Table 30: Implementation strategies for implementing child health behaviour screening in PHC, as identified in this thesis

ERIC discrete implementation strategy [258]	**Definition**	**Child Health Behaviour Screening**
Access new funding	Access new or existing money to facilitate the implementation	Access new or existing funding to facilitate the implementation of child health behaviour screening in PHC.
Assess for readiness and identify barriers and facilitators	Assess various aspects of an organization to determine its degree of readiness to implement, barriers that may impede implementation, and strengths that can be used in the implementation effort	Assess individual PHC clinics to identify readiness to implement, and unique barriers and facilitators to implementation of child health behaviour screening.
Audit and provide feedback	Collect and summarize clinical performance data over a specified time period and give it to clinicians and administrators to monitor, evaluate, and modify provider behaviour	Collect data to monitor uptake and completion of the child health behaviour screening tool in practice. Provide data and feedback to practitioners, managers and administration staff.
Change record systems	Change records systems to allow better assessment of implementation or clinical outcomes	Update medical record and PHC practice software systems to include the child health behaviour screening tool and ability to document completion and courses of action following screening.

Conduct educational meetings	Hold meetings targeted toward different stakeholder groups (*e.g.*, providers, administrators, other organizational stakeholders, and community, patient/consumer, and family stakeholders) to teach them about the clinical innovation	Conduct education meetings with PHC practitioners, managers, administration staff as well as caregivers and families to teach them about the purpose and value of child health behaviour screening in PHC.
Conduct educational outreach visits	Have a trained person meet with providers in their practice settings to educate providers about the clinical innovation with the intent of changing the provider's practice	Provide outreach educational visits to PHC clinics to educate practitioners, managers and administration staff about the purpose and value of child health behaviour screening in PHC.
Conduct ongoing training	Plan for and conduct training in the clinical innovation in an ongoing way	Provide ongoing educational training for practitioners including how to administer the tool, score, interpret and apply results to inform practice. Training should also include communication and counselling skills including the importance of inclusive language, motivational interviewing and strengths-based framing.
Develop a formal implementation blueprint	Develop a formal implementation blueprint that includes all goals and strategies. The blueprint should include the following: 1) aim/purpose of the implementation; 2) scope of the change (*e.g.*, what organizational units are affected); 3) timeframe and milestones; and 4) appropriate	Develop a formal implementation blueprint for child health behaviour screening in PHC.

	performance/progress measures. Use and update this plan to guide the implementation effort over time	
Develop academic partnerships	Partner with a university or academic unit for the purposes of shared training and bringing research skills to an implementation project	Develop a research-policy-practice partnership to support ongoing research, training and evaluation on child health behaviour screening to ensure practice and policy relevance.
Develop an implementation glossary	Develop and distribute a list of terms describing the innovation, implementation, and stakeholders in the organizational change	Develop and distribute a list of terms describing child health behaviour screening, implementation and the individuals to support implementation and practice change. Include this glossary in practitioner training and resources, including the formal implementation blueprint.
Develop educational materials	Develop and format manuals, toolkits, and other supporting materials in ways that make it easier for stakeholders to learn about the innovation and for clinicians to learn how to deliver the clinical innovation	Develop educational resources to learn how to implement, deliver and use child health behaviour screening to inform PHC practice.
Develop resource sharing agreements	Develop partnerships with organizations that have resources needed to implement the innovation	Develop partnerships with organisations to support interprofessional exchange and communication, including resources to implement child health behaviour screening in PHC.

Distribute educational materials	Distribute educational materials (including guidelines, manuals, and toolkits) in person, by mail, and/or electronically	Distribute educational resources, including guidelines, manuals and toolkits to support implementation, uptake and use of child health behaviour screening in PHC.
Facilitate relay of clinical data to providers	Provide as close to real-time data as possible about key measures of process/outcomes using integrated modes/channels of communication in a way that promotes use of the targeted innovation	Support the provision of data to practitioners regarding the implementation, use and outcomes of child health behaviour screening.
Identify and prepare champions	Identify and prepare individuals who dedicate themselves to supporting, marketing, and driving through an implementation, overcoming indifference or resistance that the intervention may provoke in an organization	Identify and train practitioners who act as a “champion” to provide practitioner training, support and advocate for screening tool use.
Make training dynamic	Vary the information delivery methods to cater to different learning styles and work contexts, and shape the training in the innovation to be interactive	Provide practitioner training on child health behaviour screening through varied delivery methods to accommodate for different learning styles, preferences and clinic contexts to ensure information is relevant, interactive and engaging.
Prepare patients/consumers	Prepare patients/consumers to be active in their care, to ask questions, and specifically to inquire about care guidelines, the evidence	Advertise and promote child health behaviour screening to caregivers and families to raise awareness of the tool and its value and purpose. Use promotion as an opportunity to

to be active participants	behind clinical decisions, or about available evidence-supported treatments	encourage caregivers and families to ask questions about their child's health behaviours with their PHC practitioner and seek appropriate resources and follow up support.
Promote adaptability	Identify the ways a clinical innovation can be tailored to meet local needs and clarify which elements of the innovation must be maintained to preserve fidelity	Identify the ways that the implementation of child health behaviour screening can be tailored to meet the local needs of a PHC clinic and support uptake, use and acceptability.
Promote network weaving	Identify and build on existing high-quality working relationships and networks within and outside the organization, organizational units, teams, etc. to promote information sharing, collaborative problem-solving, and a shared vision/goal related to implementing the innovation	Build new and develop existing professional networks and collaborations between practitioners, clinics and services to support implementation, use and exchange of information to support consistent messaging, referral pathways and avoiding unnecessary duplication of screening
Provide clinical supervision	Provide clinicians with ongoing supervision focusing on the innovation. Provide training for clinical supervisors who will supervise clinicians who provide the innovation	Provide ongoing clinical supervision and practitioner training focusing on child health behaviour screening and how to use the results to inform strengths-based health behaviour conversations in practice.
Provide local technical assistance	Develop and use a system to deliver technical assistance focused on implementation issues using local personnel	Provide local assistance to support implementation efforts in clinic. Consider local barriers and facilitators.

Purposely reexamine the implementation	Monitor progress and adjust clinical practices and implementation strategies to continuously improve the quality of care	Ongoing monitoring and evaluation of the implementation and use of child health behaviour screening to improve the quality of care provided.
Remind clinicians	Develop reminder systems designed to help clinicians to recall information and/or prompt them to use the clinical innovation	Develop and integrate reminder systems into electronic medical records and practice software to support practitioners to recall information and prompt them to use the child health behaviour screening tool in practice.
Tailor strategies	Tailor the implementation strategies to address barriers and leverage facilitators that were identified through earlier data collection	Tailor implementation strategies to local clinic context to address identified barriers and leverage facilitators.
Use mass media	Use media to reach large numbers of people to spread the word about the clinical innovation	Use mass media to reach large numbers of practitioners, caregivers and families to raise awareness of child health behaviour screening in PHC.
Use train-the-trainer strategies	Train designated clinicians or organizations to train others in the clinical innovation	Train designated practitioners to train other practitioners in child health behaviour screening in PHC. Might act as a “champion” to provide support and advocate for screening tool use.

8.5 Implications and recommendations

This thesis provides pilot evidence of the acceptability and feasibility of child health behaviour screening in South Australian Primary Health Care (PHC). A key outcome of this thesis was the development of a child health behaviour screening tool and implementation strategies to embed screening into PHC practice. The following section outlines key recommendations for future research, policy, and practice.

8.5.1 Implications for research and practice

The pilot evidence developed in this thesis of the feasibility and acceptability of child health behaviour screening in PHC in South Australia. Following pilot studies in other Australian jurisdictions, key future research activities include the need for larger scale hybrid trials to investigate implementation and effectiveness outcomes, engagement with other key PHC partners, and exploring child health behaviour screening in other settings, services, and contexts.

Larger scale trials with longer-term follow up are required to understand and establish effectiveness of child health behaviour screening on improving child health behaviours. However, for child health behaviour screening to be effective, it needs to be effectively implemented. Therefore, future research should consider conducting larger scale trials with an integrated knowledge translation approach in mind. Whilst this thinking may not traditionally align with interventionists, it is supported by the National Health and Medical Research Council Guidance for Complex Interventions and how interventions should be developed and implemented [259-262]. This thesis has demonstrated the PHC system is complex, and therefore future research might need to employ systems frameworks, moving away from linear and circular frameworks, towards systems thinking. Future research should consider utilising system frameworks to understand local barriers and facilitators to implementing child health behaviour screening in PHC, as well as considerations for scalability and sustainability in practice.

Implementation science frameworks and methodologies provide a solution for understanding how to implement an intervention in practice. Further research on implementation strategies using the ERIC framework and how to implement child health behaviour screening at scale are required. Implementation strategies need to be tailored to context, to ensure the acceptability, relevance, and sustainability of screening within practice and highlights the importance of developing site-specific implementation plans. The implementation strategies described in Section 8.4.4 can be selected and adapted to context and be used and tested in future larger-scale trials. There were 47 implementation strategies described by The ERIC

Project [258] that may benefit the implementation of child health behaviour screening in PHC yet were not explicitly identified or explored in this thesis (Table 30). These implementation strategies warrant further research. These include implementation strategies related to larger scale rollout such as funding, incentives and payment schemes, centralising support and information, mandating change and changing accreditation requirements, integrating medical software and records to support real-time data sharing and communication, in addition to establishing and leveraging advisory boards, executive boards, and expert consultation. Integrating education and training on child health behaviour screening and the importance of health-focused conversations into educational and academic institutions would support a systemic change in practice by training practitioners prior to entering the workforce.

Future research should utilise hybrid effectiveness-implementation trial designs to simultaneously understand and evaluate effectiveness and implementation outcomes within a study [263]. A larger scale trial using a hybrid effectiveness-implementation design would allow a greater understanding of the effectiveness of child health behaviour screening in PHC on child health outcomes in addition to implementation outcomes including adoption and sustainability in practice [138, 264]. In addition, future research needs to establish strategies for monitoring implementation to enable the timely identification of issues and if additional support is needed to maintain effectiveness.

This thesis captured the important perspectives of PHC practitioners and caregivers related to child health behaviour screening. Future research should explore the perspectives of other key partners in PHC such as practice managers who are key decision makers with influence upon organisational infrastructures to support prevention initiatives in PHC. Engaging with practice managers would provide valuable insight on strategies to overcome organisational barriers to implementing child health behaviour screening in PHC.

This thesis explored the feasibility and acceptability of child health behaviour screening in PHC, however future research on how to conduct effective and acceptable health behaviour conversations following screening is also required [121]. This will enable practitioners to provide individualised and strengths-based care across the 5A's Framework (Ask, Assess, Advise, Assist, Arrange) [97]. Evidence and strategies to support PHC practitioners to have strengths-based, inclusive, and culturally responsive conversations [121] and how to provide tailored strategies, resources, and referrals to support children and their families to improve their health behaviours is essential. Research exploring the training and development needs of Australian PHC practitioners to deliver early childhood prevention initiatives in PHC is being explored [232, 233, 257, 265] and can be used to support practitioners to provide strengths-based and inclusive care across the 5A's Framework.

Additionally, future research should also consider the potential of child health behaviour screening in other settings, services, and contexts as well as capturing the perspectives of children. This includes education, community, and social services including Early Education and Care, Playgroups and School settings. Implementing child health behaviour screening across diverse settings and services would enable the provision of consistent advice and support for children and caregivers. Further, there is potential for health behaviour screening as a preventive approach beyond childhood, into adolescence and adulthood.

8.5.2 Implications for policy

This thesis has key policy implications, highlighting opportunities to enhance PHC guidelines to better support early intervention and health promotion in the early years. Embedding a child health behaviour screening tool and associated resources within national PHC guidelines such as the National Framework for Universal Child and Family Health Services [158] and Guidelines for preventive activities in general practice [97], in addition to the child health record of each Australian jurisdiction, would help guide PHC practitioners to provide consistent and comprehensive monitoring and promotion of child health behaviours within routine child health checks.

Improving PHC guidelines alone is likely to be insufficient in changing routine PHC practice [107]. There is also a need for practical resources and implementation strategies including ongoing advocacy related to the availability and access of routine PHC checks in the early years [107]. The Medicare Benefits Schedule (MBS) is a list of health professional services that the Australian Government subsidises and operates on a fee-for-service model in general practice [73, 76]. To encourage and incentivise early intervention and health promotion activities in PHC, appropriate funding structures, staffing for child and family health services, and the return of a well-child MBS item to conduct screening in general practice is required [107, 240].

It has also been recognised that policy and practice partnerships lead to greater implementation and uptake of preventive activities in practice [266]. Further work is required to explore the potential of a policy and practice partnership to support implementation and sustainability of child heath behaviour screening in PHC. This could include embedding research practitioners within prevention and health promotion policy agencies and establishing diverse advisory committees to ensure future research is policy and practice relevant.

8.5.3 Implications for practice

This thesis provides pilot evidence for the feasibility and acceptability of child health behaviour screening in PHC. This is a crucial first step in building the evidence-base to inform a change in PHC practice towards a non-stigmatising and strengths-based approach to monitoring and promoting children's health behaviours in the early years. Ultimately, with evidence from future effectiveness and implementation research described in Section 8.5.1 and policy changes described in Section 8.5.2, child health behaviour screening has the potential to transform early intervention and health promotion in PHC. Child health behaviour screening aligns with PHC scope of practice across general practice, child and family health services, and allied health, demonstrating potential to provide a strengths-based and universal approach to early intervention and health promotion in the early years.

Integrating a child health behaviour screening tool into the child health record of each Australian jurisdiction poses the strongest opportunity to enable consistent and comprehensive care within routine child health checks. Additional avenues for practice change could be through integration into online health information portals such as The Royal Australian College of General Practice (RACGP) Healthy Habits [267], HealthPathways [268], Healthy Kids for Professionals [269], or Health and Wellbeing Queensland's Clinicians Hub [270]. These online portals serve as decision support tools and evidence repositories to enable PHC practitioners to access and provide comprehensive, evidence-based preventive care and support. Integrating a child health behaviour screening tool and associated resources into an online portal would enable PHC practitioners to deliver consistent and comprehensive care to monitor and promote child health behaviours. Further, online portals are widely accessible to multidisciplinary practitioners and services, enabling a system of wrap around care and coordination, to support child health, growth, and development in the early years [271].

8.6 Thesis Strengths and Considerations

The strengths and limitations of each thesis component are discussed in the relevant chapters. However, this section considers key overarching strengths and considerations relating to the overall body of research.

8.6.1 Strengths

A key strength of this thesis is the consideration of the Australian policy and practice context. This thesis included a comprehensive review of national policies and Primary Health Care (PHC) guidelines to understand the responsibilities, priorities, and recommendations across Australian PHC services. This was supplemented by a synthesis of international screening tools following best-practice guidelines [148]. The local South Australian PHC context was subsequently considered in the development and pilot testing of a child health behaviour screening tool. The use of the Knowledge to Action (KTA) Framework was a strength of this research to ensure appropriate evidence enquiry and application [23]. Each study conducted in this thesis aligned with the KTA Framework and informed the subsequent study, demonstrating the theoretically and evidence-informed design across the four studies within this thesis. Additionally, this thesis considered the role and perspectives of multidisciplinary PHC practitioners (including general practitioners, nurses and allied health professionals) in delivering early childhood prevention initiatives, rather than focusing on one service or discipline.

8.6.2 Considerations

While there were several strengths to this thesis, the considerations of this thesis should also be acknowledged. First and foremost, this thesis demonstrates proof-of-concept evidence of feasibility and acceptability, with further research needed to understand effectiveness and implementation. Given the research needed to be iterative in nature using the evidence generated from each study to inform the subsequent stage, the KTA Framework was used and applied in a fluid manner, moving between and simultaneously engaging in knowledge creation and application. This may suggest the need for future research to consider more complex or systems thinking approaches when developing and designing PHC interventions.

The context of this thesis should also be acknowledged when interpreting the findings of Chapter 6 (PHC Practitioner Workshops) and Chapter 7 (Caregiver Acceptability Study) as they describe the perspectives of a small sample size of South Australian PHC practitioners and caregivers and therefore limiting the generalisability of the results. However, the chosen study designs and recruitment strategies were appropriate for understanding pilot feasibility

and acceptability relevant to the local South Australian context and provides crucial evidence to inform larger scale implementation and effectiveness studies. The influence of the researcher should also be considered, particularly as a facilitator of the PHC practitioner workshops and facilitator of recruitment and data collection of caregivers. Finally, the context of the PHC clinic where the child health behaviour screening tool was pilot tested should also be considered. As a student-led clinic located on a university campus, the level of caregiver engagement and perspectives may be different to other community-based clinics, reiterating the need for a larger scale trial.

8.7 Conclusion

This thesis aimed to determine the feasibility and acceptability of embedding child health behaviour screening within routine Primary Health Care (PHC) as a strategy to support growth, health, and development in the early years.

A multi-stage research program, aligned with the Knowledge to Action Framework, enabled knowledge creation, evidence synthesis, and development of tailored research products that considered the Australian PHC practice and policy context. The scoping review of Australian PHC guidelines demonstrated that monitoring and promoting child health behaviours is a recognized role for PHC, however there are limited tools to support practitioners to conduct these responsibilities in practice (Chapter 4). The systematic review indicated that child health behaviour screening tools exist internationally, however none have been developed or tested in an Australian PHC context (Chapter 5). Nominal Group Technique workshops with PHC practitioners highlighted key tool features and implementation strategies to support acceptability and feasibility of child health behaviour screening in Australian PHC (Chapter 6). Finally, the caregiver acceptability study demonstrates pilot feasibility and acceptability of child health behaviour screening within an Australian PHC context (Chapter 7).

Overall, this thesis provides an original and valuable contribution to the scientific knowledge of early intervention and health promotion in early childhood. This thesis demonstrates that child health behaviour screening aligns with Australian PHC guidelines and provides pilot evidence of PHC practitioner and caregiver acceptability and feasibility of a child health behaviour screening tool in an Australian PHC context. The evidence produced from this thesis provides clear direction to inform future research as a path towards policy and practice change to better support children's growth, health, and development in the early years. Future research is required to understand effectiveness of child health behaviour screening in changing PHC practice, overcoming challenges and barriers to growth monitoring, through increased rates of health behaviour screening, and the provision of tailored health behaviour advice, resources and referrals. Future research on how to effectively implement child health behaviour screening at scale is also required, alongside updated policy and practice guidelines to support and sustain practice.

Ultimately, this research provides proof-of-concept evidence for the feasibility and acceptability of child health behaviour screening in Australian PHC. This thesis further provides crucial evidence to inform next steps towards building the evidence-base for embedding child health behaviour screening within routine PHC as a strengths-based and universal approach to support children's growth, health, and development in the early years.

9 REFERENCES

1. Johnson, B., Middleton G., Dutch, D., Manson A., Golley R. , *Navigating the Early Years System in South Australia: Desk-based mapping of touchpoints and transition points*. 2022: Caring Futures Institute, Flinders University.
2. Brown, V., et al., *Core outcome set for early intervention trials to prevent obesity in childhood (COS-EPOCH): Agreement on "what" to measure.* International Journal of Obesity, 2022. **46**(10): p. 1867-1874.
3. Matvienko-Sikar, K., et al., *A core outcome set for trials of infant-feeding interventions to prevent childhood obesity.* Int J Obes (Lond), 2020. **44**(10): p. 2035-2043.
4. Middleton, G., et al., *Navigating the Early Years System in South Australia: Exploring the Caregiver Journey from Multiple Perspectives.* 2022.
5. Australian Government, *Early Years Strategy 2024-2034*, D.o.S. Services, Editor. 2024.
6. Panpanich, R. and P. Garner, *Growth monitoring in children.* Cochrane Database Syst Rev, 2000(2): p. Cd001443.
7. World Health Organisation, *Basic documents: Forty-ninth edition (including amendments adopted up to 31 May 2019)*. 2020: Geneva.
8. Buse, K.M., Nicholas; and Walt, Gill., *Making Health Policy*. Second ed. 2012, UK: McGraw-Hill Education.
9. Eccles, M.P. and B.S. Mittman, *Welcome to Implementation Science.* Implementation Science, 2006. **1**(1): p. 1.
10. Bauer, M.S. and J. Kirchner, *Implementation science: what is it and why should I care?* Psychiatry research, 2020. **283**: p. 112376.
11. Proctor, E.K., B.J. Powell, and J.C. McMillen, *Implementation strategies: recommendations for specifying and reporting.* Implementation science, 2013. **8**: p. 1-11.
12. Grimshaw, J.M., et al., *Knowledge translation of research findings.* Implementation Science, 2012. **7**(1): p. 50.
13. Lynch, E.A., et al., *"There is nothing so practical as a good theory": a pragmatic guide for selecting theoretical approaches for implementation projects.* BMC Health Services Research, 2018. **18**(1): p. 857.
14. Boland, L., et al., *Building an integrated knowledge translation (IKT) evidence base: colloquium proceedings and research direction.* Health Research Policy and Systems, 2020. **18**(1): p. 8.
15. Kothari, A., C. McCutcheon, and I.D. Graham, *Defining integrated knowledge translation and moving forward: a response to recent commentaries.* International journal of health policy and management, 2017. **6**(5): p. 299.
16. Manera, K., et al., *Consensus Methods: Nominal Group Technique*, in *Handbook of Research Methods in Health Social Sciences*, P. Liamputtong, Editor. 2019, Springer Singapore: Singapore. p. 737-750.
17. McMillan, S.S., M. King, and M.P. Tully, *How to use the nominal group and Delphi techniques.* Int J Clin Pharm, 2016. **38**(3): p. 655-62.
18. World Health Organisation, *Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age*. 2019: Geneva.
19. World Health Organisation and the United Nations Children's Fun (UNICEF), *A vision for primary health care in the 21st century: towards universal health coverage and the Sustainable Development Goals.* 2018, WHO/HIS/SDS/2018.X: Geneva.
20. Brown, V., et al., *A scoping review of outcomes commonly reported in obesity prevention interventions aiming to improve obesity-related health behaviors in children to age 5 years.* Obes Rev, 2022: p. e13427.

21. Commonwealth of Australia, *National Preventive Health Strategy 2021-2030*, Department of Health (DoH), Editor. 2021.
22. Hennessy, M., et al., *Childhood obesity prevention: priority areas for future research and barriers and facilitators to knowledge translation, coproduced using the nominal group technique.* Translational Behavioral Medicine, 2018. **9**(4): p. 759-767.
23. Graham, I.D., et al., *Lost in knowledge translation: Time for a map?* Journal of Continuing Education in the Health Professions, 2006. **26**(1).
24. Birch, L.L. and J.O. Fisher, *Development of eating behaviors among children and adolescents.* Pediatrics, 1998. **101**(3 Pt 2): p. 539-49.
25. Kuzik, N., et al., *Systematic review of the relationships between combinations of movement behaviours and health indicators in the early years (0-4 years).* Bmc Public Health, 2017. **17**.
26. Netting, M.J., et al., *The Australian Feeding Infants and Toddlers Study (OzFITS) 2021: Highlights and Future Directions.* Nutrients, 2022. **14**(20).
27. Moumin, N.A., et al., *Usual Nutrient Intake Distribution and Prevalence of Inadequacy among Australian Children 0-24 Months: Findings from the Australian Feeding Infants and Toddlers Study (OzFITS) 2021.* Nutrients, 2022. **14**(7).
28. Moumin, N.A., et al., *The Australian Feeding Infants and Toddlers Study (OzFITS) 2021: Study Design, Methods and Sample Description.* Nutrients, 2021. **13**(12).
29. Council, C.H., *Australian National Breastfeeding Strategy: 2019 and beyond*. 2019.
30. National Health and Medical Research Council (NHMRC), *Australian Dietary Guidelines*, Commonwealth of Australia, Editor. 2013: Canberra.
31. Department of Health, *Australian 24 Hour Movement Guidelines for the Early Years (birth to 5 years)*. 2017.
32. Craigie, A.M., et al., *Tracking of obesity-related behaviours from childhood to adulthood: A systematic review.* Maturitas, 2011. **70**(3): p. 266-284.
33. Wang, Y., et al., *Tracking of dietary intake patterns of Chinese from childhood to adolescence over a six-year follow-up period.* J Nutr, 2002. **132**(3): p. 430-8.
34. Wang, L., et al., *Identifying patterns of lifestyle behaviours among children of 3 years old.* European Journal of Public Health, 2020. **30**(6): p. 1115-1121.
35. Australian Bureau of Statistics, *Health Conditions Prevalence, 2020-21.* 2022.
36. Australian Institute of Health and Welfare. *Chronic conditions and multimorbidity*. 2022 [cited 2022 November]; Available from: https://www.aihw.gov.au/reports/australias-health/chronic-conditions-and-multimorbidity.
37. Australian Institute of Health and Welfare. *Australian Burden of Disease Study 2018: Interactive data on risk factor burden*. 2021 [cited 2022 November]; Available from: https://www.aihw.gov.au/reports/burden-of-disease/abds-2018-interactive-data-risk-factors/contents/summary.
38. Terry, M.B. and M.R. Forman, *Empowering Pediatricians to Prevent Chronic Disease Across Generations.* Pediatrics, 2016. **138**(Supplement_1): p. S92-S94.
39. Campbell, K.J. and K.D. Hesketh, *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.* Obes Rev, 2007. **8**(4): p. 327-38.
40. Lioret, S., et al., *Lifestyle Patterns Begin in Early Childhood, Persist and Are Socioeconomically Patterned, Confirming the Importance of Early Life Interventions.* Nutrients, 2020. **12**(3).
41. Champion, K.E., et al., *Lifestyle risks for chronic disease among Australian adolescents: a cross-sectional survey.* Medical Journal of Australia, 2022. **216**(3): p. 156-157.
42. Birch, L., J.S. Savage, and A. Ventura, *Influences on the Development of Children's Eating Behaviours: From Infancy to Adolescence.* Canadian journal of dietetic practice and research : a publication of Dietitians of Canada = Revue canadienne de la pratique et de la recherche en dietetique : une publication des Dietetistes du Canada, 2007. **68**(1): p. s1-s56.

43. Carson, V., et al., *Systematic review of the relationships between physical activity and health indicators in the early years (0-4 years).* BMC public health, 2017. **17**: p. 33-63.
44. Chaput, J.-P., et al., *Systematic review of the relationships between sleep duration and health indicators in the early years (0–4 years).* BMC public health, 2017. **17**: p. 91-107.
45. Poitras, V.J., et al., *Systematic review of the relationships between sedentary behaviour and health indicators in the early years (0–4 years).* BMC public health, 2017. **17**: p. 65-89.
46. van der Velde, L.A., et al., *Diet quality in childhood: the Generation R Study.* European journal of nutrition, 2019. **58**(3): p. 1259-1269.
47. Ford, C., D. Ward, and M. White, *Television viewing associated with adverse dietary outcomes in children ages 2–6.* Obesity reviews, 2012. **13**(12): p. 1139-1147.
48. Córdova, F.V., S. Barja, and P.E. Brockmann, *Consequences of short sleep duration on the dietary intake in children: A systematic review and metanalysis.* Sleep Med Rev, 2018. **42**: p. 68-84.
49. Gazmararian, J. and J. Smith, *Role of sleep duration and obesity-related health behaviors in young children.* Prev Med Rep, 2020. **20**: p. 101199.
50. Krijger, A., et al., *Clusters of lifestyle behaviours and their associations with socio-demographic characteristics in Dutch toddlers.* European Journal of Nutrition, 2023. **62**(3): p. 1143-1151.
51. Hamner, H.C. and L.V. Moore, *Dietary quality among children from 6 months to 4 years, NHANES 2011–2016.* The American Journal of Clinical Nutrition, 2019. **111**(1): p. 61-69.
52. Farooq, M.A., et al., *Timing of the decline in physical activity in childhood and adolescence: Gateshead Millennium Cohort Study.* British Journal of Sports Medicine, 2018. **52**(15): p. 1002-1006.
53. Tanaka, C., J.J. Reilly, and W.Y. Huang, *Longitudinal changes in objectively measured sedentary behaviour and their relationship with adiposity in children and adolescents: systematic review and evidence appraisal.* Obesity Reviews, 2014. **15**(10): p. 791-803.
54. Australian Institute of Health and Welfare, *Physical activity across the life stages*. 2018, AIHW: Canberra.
55. The Royal Australian College of General Practitioners, *Smoking, nutrition, alcohol, physical activity (SNAP): A population health guide to behavioural risk factors in general practice, 2nd Edition*. 2015, RACGP: Melbourne.
56. Syme, S.L., *The prevention of disease and promotion of health: the need for a new approach.* Eur J Public Health, 2007. **17**(4): p. 329-30.
57. National Health and Medical Research Council (NHMRC), *Infant Feeding Guidelines: information for health workers,*. 2012: Canberra.
58. Australian Institute of Health and Welfare, *Nutrition across the life stages*. 2018, AIHW: Canberra.
59. Australian Bureau of Statistics. *Dietary behaviour*. 2020-21 accessed 25 November 2022]; Available from: https://www.abs.gov.au/statistics/health/health-conditions-and-risks/dietary-behaviour/latest-release.
60. Baker, S., A. Morawska, and A.E. Mitchell, *Do Australian children carry out recommended preventive child health behaviours? Insights from an online parent survey.* Journal of Paediatrics and Child Health, 2020. **56**(6): p. 900-907.
61. Wood, A.C., et al., *Caregiver Influences on Eating Behaviors in Young Children.* Journal of the American Heart Association, 2020. **9**(10): p. e014520.
62. Morgan, E.H., et al., *Caregiver involvement in interventions for improving children's dietary intake and physical activity behaviors.* Cochrane Database Syst Rev, 2020. **1**(1): p. Cd012547.
63. Skouteris, H., et al., *Parental influence and obesity prevention in pre-schoolers: a systematic review of interventions.* Obesity Reviews, 2011. **12**(5): p. 315-328.

64. de Vet, E., D.T.D. de Ridder, and J.B.F. de Wit, *Environmental correlates of physical activity and dietary behaviours among young people: a systematic review of reviews.* Obesity Reviews, 2011. **12**(5): p. e130-e142.
65. Robinson, S., et al., *Dietary patterns in infancy: the importance of maternal and family influences on feeding practice.* Br J Nutr, 2007. **98**(5): p. 1029-37.
66. Rivera, E., et al., *Prevalence of toddlers meeting 24-hour movement guidelines and associations with parental perceptions and practices.* Journal of science and medicine in sport, 2024. **27**(4): p. 250-256.
67. Peters, J., et al., *Associations between parenting styles and nutrition knowledge and 2–5-year-old children's fruit, vegetable and non-core food consumption.* Public health nutrition, 2013. **16**(11): p. 1979-1987.
68. Ellyn Satter Institute. *Raise a healthy child who is a joy to feed*. 2022; Available from: https://www.ellynsatterinstitute.org/how-to-feed/the-division-of-responsibility-in-feeding/.
69. Bruijns, B.A., et al., *Physical activity, sedentary behaviour, and sleep knowledge and self-efficacy among parents of young children in Canada.* Journal of Activity, Sedentary and Sleep Behaviors, 2024. **3**(1): p. 12.
70. Hennessy, M., et al., *"They Just Need to Come Down a Little Bit to Your Level": A Qualitative Study of Parents' Views and Experiences of Early Life Interventions to Promote Healthy Growth and Associated Behaviours.* International Journal of Environmental Research and Public Health, 2020. **17**(10).
71. Pikora, T., Christian, H., Trapp, G., Villanueva, K.,, *Chronic disease prevention interventions in children and young adults: A rapid review prepared for the Australian Government Department of Health on Behaviour of The Australian Prevention Partnership Centre*. 2016.
72. Australian Institute of Health and Welfare. *Primary health care in Australia*. 2016; Available from: https://www.aihw.gov.au/reports/primary-health-care/primary-health-care-in-australia/contents/about-primary-health-care.
73. Australian Government. *MBS Online*. 2022 25 November 2022]; Available from: http://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Home.
74. Dugani, S., J. Veillard, and T.G. Evans, *Quality primary health care will drive the realization of universal health coverage.* Cmaj, 2018. **190**(15): p. E453-e454.
75. Commonwealth of Australia, *Future focused primary health care: Australia's Primary Health Care 10 Year Plan 2022-2032*, Department of Health (DoH), Editor. 2022.
76. Australia, C.o., *An MBS for the 21st Century: Recommendations, Learnings and Ideas for the Future. Medicare Benefits Schedule Review Taskforce Final Report to the Minister for Health*. 2020.
77. Gooey, M., et al., *Addressing obesity: determined action and bold leadership required for change.* Public Health Res Pract, 2022. **32**(3): p. e3232219.
78. Chung, A., et al., *Integrating health, social care and education across the first 2,000 days.* Australian and New Zealand Journal of Public Health, 2023. **47**(1): p. 100014.
79. Gooey, M., et al., *Clinical practice guidelines for the prevention of childhood obesity: A systematic review of quality and content.* Obesity Reviews, 2022. **23**(10): p. e13492.
80. Esdaile, E., et al., *National policies to prevent obesity in early childhood: Using policy mapping to compare policy lessons for Australia with six developed countries.* Obesity Reviews, 2019. **20**(11): p. 1542-1556.
81. Esdaile, E.K., et al., *Australian state and territory eclectic approaches to obesity prevention in the early years: policy mapping and perspectives of senior health officials.* Frontiers in Public Health, 2022. **10**: p. 781801.
82. Esdaile, E.K., et al., *Intergovernmental policy opportunities for childhood obesity prevention in Australia: Perspectives from senior officials.* Plos one, 2022. **17**(4): p. e0267701.
83. Endalamaw, A., et al., *Successes, weaknesses, and recommendations to strengthen primary health care: a scoping review.* Archives of Public Health, 2023. **81**(1): p. 100.

84. Commonwealth of Australia, *The National Obesity Strategy 2022-2032*, Health Ministers Meeting, Editor. 2022.
85. Australian Commission on Safety and Quality in Health Care (ACSQHC), *National Safety and Quality Primary and Community Healthcare Standards*. 2021, ACSQHC: Sydney.
86. Commonwealth of Australia, *National Health Reform Agreement - Addendum 2020-25*, Department of Health (DoH), Editor. 2020.
87. Commonwealth of Australia, *Australia's Long Term National Health Plan - to build the world's best health system*, Department of Health, Editor. 2019, DoH.
88. Commonwealth of Australia, *National Action Plan for the Health of Children and Young People 2020-2030*, Department of Health, Editor. 2019, DoH: Canberra.
89. Department of Health., *National Framework for Health Services for Aboriginal and Torres Strait Islander Children and Families*. 2016, Australian Government.
90. Commonwealth of Australia, *National Primary Health Care Strategic Framework*, Standing Council on Health, Editor. 2013.
91. Mayne, S.L., et al., *Parent and Primary Care Provider Priorities for Wellness in Early Childhood: A Discrete Choice Experiment.* Journal of Child and Family Studies, 2021. **30**(9): p. 2238-2249.
92. Rossiter, C., et al., *Australian parents' use of universal child and family health services: A consumer survey.* Health & Social Care in the Community, 2019. **27**(2): p. 472-482.
93. Hayes, A.J., et al., *Patterns and costs of health-care utilisation in Australian children: The first 5 years.* Journal of Paediatrics and Child Health, 2019. **55**(7): p. 802-808.
94. Ou, L., J. Chen, and K. Hillman, *Socio-demographic disparities in the utilisation of general practice services for Australian children-Results from a nationally representative longitudinal study.* PLoS One, 2017. **12**(4): p. e0176563.
95. Cheng, H., et al., *Promoting healthy weight for all young children: a mixed methods study of child and family health nurses' perceptions of barriers and how to overcome them.* BMC Nursing, 2020. **19**(1): p. 84.
96. Wightman, L., A. Hutton, and J. Grant, *Child and family health nurses' roles in the care of infants and children: A scoping review.* Journal of Child Health Care, 2022. **26**(3): p. 448-460.
97. The Royal Australian College of General Practitioners, *Guidelines for preventive activities in general practice*, RACGP, Editor. 2024: East Melbourne, Victoria.
98. Robinson, A., et al., *Child obesity prevention in primary health care: Investigating practice nurse roles, attitudes and current practices.* Journal of Paediatrics and Child Health, 2013. **49**(4): p. E294-E299.
99. World Health Organisation, *Guideline: assessing and managing children at primary health-care facilities to prevent overweight and obesity in the context of the double burden of malnutrition. Updates for the Integrated Management of Childhood Illness (IMCI)*. 2017, WHO: Geneva.
100. Garner, P., R. Panpanich, and S. Logan, *Is routine growth monitoring effective? A systematic review of trials.* Archives of Disease in Childhood, 2000. **82**(3): p. 197-201.
101. World Health Organisation. *Child growth standards*. 25 November 2022]; Available from: https://www.who.int/tools/child-growth-standards/standards.
102. Centers for Disease Control and Prevention. *Clinical Growth Charts*. 2017; Available from: https://www.cdc.gov/growthcharts/clinical_charts.htm.
103. Harris, M., *The interface between primary health care and population health: challenges and opportunities for prevention.* Public Health Research & Practice, 2016. **26**(1): p. e2611601.
104. Harris, M. and J. Lloyd, *The role of Australian primary health care in the prevention of chronic disease.* Canberra: Australian National Preventive Health Agency, 2012.

105. The Royal Australian College of General Practitioners, *Views and attitudes towards physical activity and nutrition counselling in general practice: National survey report 2019*. 2019, RACGP: East Melbourne, VIC.
106. House, E.T., et al., *Parental experiences of primary health professional support with child health behaviours and growth: a scoping review.* Preventive Medicine, 2025. **197**: p. 108313.
107. Gooey, M., et al., *Embedding child health promotion and preventive care within primary health care: From agenda to action.* Health Promotion Journal of Australia, 2025. **36**(2): p. e70027.
108. Ashworth, A., R. Shrimpton, and K. Jamil, *Growth monitoring and promotion: review of evidence of impact.* Matern Child Nutr, 2008. **4 Suppl 1**(Suppl 1): p. 86-117.
109. Garner, P., R. Panpanich, and S. Logan, *Is routine growth monitoring effective? A systematic review of trials.* Arch Dis Child, 2000. **82**(3): p. 197-201.
110. Sim, L.A., et al., *Brief Primary Care Obesity Interventions: A Meta-analysis.* Pediatrics, 2016. **138**(4).
111. Ben-Joseph, E.P., S.A. Dowshen, and N. Izenberg, *Do parents understand growth charts? A national, Internet-based survey.* Pediatrics, 2009. **124**(4): p. 1100-9.
112. Hale, I. and E. Jackson, *Evaluating routine pediatric growth measurement as a screening tool for overweight and obese status.* Can Fam Physician, 2021. **67**(3): p. 161-165.
113. Ziegler, E.E. and S.E. Nelson, *The WHO growth standards: strengths and limitations.* Curr Opin Clin Nutr Metab Care, 2012. **15**(3): p. 298-302.
114. Mansoor, Y. and I. Hale, *Parent perceptions of routine growth monitoring: A scoping review.* Paediatr Child Health, 2021. **26**(3): p. 154-158.
115. McMeniman, E., et al., *Childhood obesity: how do Australian general practitioners feel about managing this growing health problem?* Aust J Prim Health, 2011. **17**(1): p. 60-5.
116. de Onis, M., T.M. Wijnhoven, and A.W. Onyango, *Worldwide practices in child growth monitoring.* J Pediatr, 2004. **144**(4): p. 461-5.
117. Rossiter, C., H. Cheng, and E. Denney-Wilson, *Primary healthcare professionals' role in monitoring infant growth: A scoping review.* Journal of Child Health Care, 2023: p. 13674935231165897.
118. Laws, R., et al., *Obesity prevention in early life: an opportunity to better support the role of Maternal and Child Health Nurses in Australia.* BMC Nurs, 2015. **14**: p. 26.
119. Krstic, S., et al., *What do parents think about child's routine height and weight measures? A qualitative study.* Australian Journal of Primary Health, 2024. **30**(1): p. -.
120. Hardy, K., et al., *Australian parents' experiences when discussing their child's overweight and obesity with the maternal and child health nurse: a qualitative study.* Journal of clinical nursing, 2019. **28**(19-20): p. 3610-3617.
121. Albury, C., et al., *Communication practices for delivering health behaviour change conversations in primary care: a systematic review and thematic synthesis.* BMC Family Practice, 2019. **20**(1): p. 111.
122. Ljungkrona-Falk, L., H. Brekke, and M. Nyholm, *Swedish nurses encounter barriers when promoting healthy habits in children.* Health promotion international, 2014. **29**(4): p. 730-738.
123. Turer, C.B., et al., *Primary-Care Weight-Management Strategies: Parental Priorities and Preferences.* Acad Pediatr, 2016. **16**(3): p. 260-6.
124. Denney-Wilson, E., H. Cheng, and R. Eames-Brown, *Exploring the Infant Feeding Advice Provided by Child Family Health Nurses in SLHD and SWSLHD: Final report*. 2018, University of Sydney: Sydney.
125. Byrne, R., et al., *Brief tools to measure obesity-related behaviours in children under 5 years of age: A systematic review.* Obesity Reviews, 2019. **20**(3): p. 432-447.
126. Krijger, A., et al., *Lifestyle Screening Tools for Children in the Community Setting: A Systematic Review.* Nutrients, 2022. **14**(14).

127. Campbell, K.J. and K.D. Hesketh, *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): p. 327-338.
128. Goundar, P.R., *Researcher Positionality: Ways to Include it in a Qualitative Research Design.* International Journal of Qualitative Methods, 2025. **24**: p. 16094069251321251.
129. Hurst, A., *Introduction to Qualitative Research Methods: A Helpful Guide for Undergraduates and Graduate Students in the Social Sciences*. Oregon State University.
130. Kelly, L.M. and M. Cordeiro, *Three principles of pragmatism for research on organizational processes.* Methodological Innovations, 2020. **13**(2): p. 2059799120937242.
131. Kaushik, V. and C.A. Walsh, *Pragmatism as a Research Paradigm and Its Implications for Social Work Research.* Social Sciences, 2019. **8**(9): p. 255.
132. Bauer, M.S. and J. Kirchner, *Implementation science: What is it and why should I care?* Psychiatry Res, 2020. **283**: p. 112376.
133. Harrison, M.B., et al., *Adapting clinical practice guidelines to local context and assessing barriers to their use.* Cmaj, 2010. **182**(2): p. E78-84.
134. Ray, D., et al., *Barriers and facilitators to implementing practices for prevention of childhood obesity in primary care: A mixed methods systematic review.* Obesity Reviews, 2022. **n/a**(n/a).
135. Deverka, P.A., et al., *Stakeholder participation in comparative effectiveness research: defining a framework for effective engagement.* Journal of comparative effectiveness research, 2012. **1**(2): p. 181-194.
136. Reed, M.S., et al., *Reimagining the language of engagement in a post-stakeholder world.* Sustainability Science, 2024. **19**(4): p. 1481-1490.
137. Development, C.f.C.H.a. *Community Tool Box Chapter 7, Section 8: Identifying and Analyzing Stakeholders and Their Interests*. 2025 [cited 2025; Available from: https://ctb.ku.edu/en/table-of-contents/participation/encouraging-involvement/identify-stakeholders/main.
138. Proctor, E., et al., *Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda.* Adm Policy Ment Health, 2011. **38**(2): p. 65-76.
139. Varvasovszky, Z. and R. Brugha, *A stakeholder analysis.* Health Policy and Planning, 2000. **15**(3): p. 338-345.
140. Lau, R., et al., *Achieving change in primary care—causes of the evidence to practice gap: systematic reviews of reviews.* Implementation Science, 2016. **11**(1): p. 40.
141. Wolfenden, L., et al., *Designing and undertaking randomised implementation trials: guide for researchers.* BMJ, 2021. **372**: p. m3721.
142. Lewis, L., et al., *Wellbeing of Older Persons in Residential Aged Care Stage 1: Final Report*. 2020.
143. Straus, S.E., J. Tetroe, and I. Graham, *Defining knowledge translation.* Cmaj, 2009. **181**(3-4): p. 165-8.
144. Thomas, A., et al., *Knowledge syntheses in medical education: demystifying scoping reviews.* Academic Medicine, 2017. **92**(2): p. 161-166.
145. Munn, Z., et al., *Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach.* BMC medical research methodology, 2018. **18**: p. 1-7.
146. Tricco, A.C., et al., *PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation.* Ann Intern Med, 2018. **169**(7): p. 467-473.
147. Clarke, J., *What is a systematic review?* Evidence Based Nursing, 2011. **14**(3): p. 64-64.
148. Page, M.J., et al., *The PRISMA 2020 statement: an updated guideline for reporting systematic reviews.* BMJ, 2021. **372**: p. n71.

149. McMillan, S.S., et al., *Using the Nominal Group Technique: how to analyse across multiple groups.* Health Services and Outcomes Research Methodology, 2014. **14**(3): p. 92-108.
150. Gallagher, M., et al., *The nominal group technique: a research tool for general practice?* Family practice, 1993. **10**(1): p. 76-81.
151. Delbecq, A.L. and A.H. Van de Ven, *A group process model for problem identification and program planning.* The journal of applied behavioral science, 1971. **7**(4): p. 466-492.
152. Harvey, N. and C.A. Holmes, *Nominal group technique: an effective method for obtaining group consensus.* International Journal of Nursing Practice, 2012. **18**(2): p. 188-194.
153. Humphrey-Murto, S., et al., *Using consensus group methods such as Delphi and Nominal Group in medical education research.* Medical teacher, 2017. **39**(1): p. 14-19.
154. Von Elm, E., et al., *The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies.* The lancet, 2007. **370**(9596): p. 1453-1457.
155. Eldridge, S.M., et al., *CONSORT 2010 statement: extension to randomised pilot and feasibility trials.* BMJ, 2016. **355**: p. i5239.
156. Kuzik, N., et al., *Systematic review of the relationships between combinations of movement behaviours and health indicators in the early years (0-4 years).* BMC Public Health, 2017. **17**(Suppl 5): p. 849.
157. World Health Organisation., *Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age*. 2019: Geneva.
158. Australian Health Ministers Advisory Council, *The National Framework for Universal Child and Family Health Services*, Australian Government Department of Health and Ageing, Editor. 2011: Canberra.
159. Australian Government. *General Practice Workforce providing Primary Care services in Australia*. 2024 [cited 2024 July]; 3]. Available from: https://hwd.health.gov.au/resources/data/gp-primarycare.html.
160. Grant, J., Mitchell, C & Cuthbertson, L., *National Standards of Practice for Maternal, Child and Family Health Nursing Practice in Australia*. 2017: Adelaide.
161. Green, J.T., N, *Qualitative Methods for Health Research*. Fourth Edition ed. 2018.
162. Jia, C., et al., *5W+ 1H pattern: A perspective of systematic mapping studies and a case study on cloud software testing.* Journal of Systems and Software, 2016. **116**: p. 206-219.
163. National Aboriginal Community Controlled Health Organisation and The Royal Australian College of General Practitioners., *National guide to preventive healthcare for Aboriginal and Torres Strait Islander people*, RACGP, Editor. 2024: East Melbourne, Victoria.
164. Victorian Government, *Maternal and child health services practice guidelines 2009*, Department of Health and Human Services, Editor. 2009: Melbourne.
165. Government of Western Australia, *Community Health Clinical Nursing Manual*, Child and Adolescent Health Service, Editor. 2017: Western Australia.
166. ACT Government, *Canberra Hospital and Health Services Clinical Procedure; Maternal and Child Health Procedures in the ACT*, ACT Health, Editor. 2018: Canberra.
167. Queensland Health, Royal Flying Doctor Service (Queensland Section), and Apunipima Cape York Health Council, *Chronic Conditions Manual: Prevention and Management of Chronic Conditions in Rural and Remote Australia*, The Rural and Remote Clinical Support Unit; Torres and Cape Hospital and Health Service, Editor. 2020: Cairns.
168. Childrens Health Queensland Hospital and Health Service, *Child and Youth Health Practice Manual*, Queensland Child and Youth Clinical Network - Child Health Sub-Network, Editor. 2020: Queensland.

169. State of Queensland, *Guideline: Assessing infant/child nutrition, growth, and development within the primary health care setting*, Queensland Health, Editor. 2022: Brisbane.
170. Government of Western Australia, *Purple Book*, Child and Adolescent Health Service, Editor. 2018: Western Australia.
171. Northern Territory Government, *My child health record (Yellow Book)*, Department of Health, Editor. 2018: Northern Territory.
172. Government of South Australia, *My Health and Development Record (Blue Book)*, Child and Family Health Service, Editor. 2021: South Australia.
173. New South Wales Government, *My personal health record (Blue Book)*, NSW Ministry of Health, Editor. 2022: New South Wales.
174. Queensland Government, *Personal Health Record (Red Book)*, Queensland Health, Editor. 2022: Queensland.
175. ACT Government, *My Personal Health Record Book (Blue Book)*, ACT Health, Editor. 2022: Canberra.
176. Victorian Government, *My Health, Learning and Development Record (Green Book)*, Department of Health, Editor. 2022: Victoria.
177. Tasmanian Government, *Personal Health Record (Blue Book)*, Tasmanian Health Service: Child Health and Parenting Service, Editor. 2023: Tasmania.
178. The Royal Australian College of General Practitioners, *Putting prevention into practice: Guidelines for the implementation of prevention in the general practice setting*, RACGP, Editor. 2018: East Melbourne, Victoria.
179. Queensland Government, *Child Health Information: Your guide to the first 12 months*, Childrens Health Queensland Hospital and Health Service, Editor. 2022: Queensland.
180. Hendrickson, M.A. and M.B. Pitt, *Three Areas Where Our Growth Chart Conversations Fall Short-Room to Grow.* JAMA Pediatr, 2022. **176**(2): p. 123-124.
181. Denney-Wilson, E., H. Cheng, and R. Eames-Brown,, *Exploring the Infant Feeding Advice Provided by Child Family Health Nurses in SLHD and SWSLHD: Final report*. 2018.
182. Ben-Joseph, E.P., S.A. Dowshen, and N. Izenberg, *Do parents understand growth charts? A national, internet-based survey.* Pediatrics, 2009. **124**(4): p. 1100-1109.
183. Dutch, D., et al., *Screening tools used in primary health care settings to identify health behaviours in children (birth–16 years); A systematic review of their effectiveness, feasibility and acceptability.* Obesity Reviews, 2024. **25**(4): p. e13694.
184. Owens, J.A. and V. Dalzell, *Use of the 'BEARS'sleep screening tool in a pediatric residents' continuity clinic: a pilot study.* Sleep medicine, 2005. **6**(1): p. 63-69.
185. Jeyendra, A., et al., *Australian general practitioners' perspectives on their role in well-child health care.* BMC Family Practice, 2013. **14**: p. 1-7.
186. Australian Government, *NHMRC Research Translation Strategy 2022-2025*, National Health and Medical Research Council, Editor. 2022.
187. Mthethwa, R.M., *Critical dimensions for policy implementation.* 2012.
188. Lee, I.-M. and E.J. Shiroma, *Using accelerometers to measure physical activity in large-scale epidemiological studies: issues and challenges.* British journal of sports medicine, 2014. **48**(3): p. 197-201.
189. Magarey, A., et al., *Assessing dietary intake in children and adolescents: considerations and recommendations for obesity research.* International Journal of Pediatric Obesity, 2011. **6**(1): p. 2-11.
190. Leech, R.M., S.A. McNaughton, and A. Timperio, *Clustering of diet, physical activity and sedentary behaviour among Australian children: cross-sectional and longitudinal associations with overweight and obesity.* Int J Obes (Lond), 2015. **39**(7): p. 1079-85.
191. Leech, R.M., S.A. McNaughton, and A. Timperio, *The clustering of diet, physical activity and sedentary behavior in children and adolescents: a review.* International Journal of Behavioral Nutrition and Physical Activity, 2014. **11**(1): p. 4.

192. Watanabe, E., et al., *Clustering patterns of obesity-related multiple lifestyle behaviours and their associations with overweight and family environments: a cross-sectional study in Japanese preschool children.* BMJ open, 2016. **6**(11): p. e012773.
193. Government of South Australia., *Consent to Medical Treatment and Palliative Care Act 1995*. 2023.
194. Covidence. *Covidence Systematic Review Software*. Available from: https://www.covidence.org/.
195. Hong, Q.N., et al., *The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers.* Education for Information, 2018. **34**: p. 285-291.
196. Beno, L., et al., *Design and implementation of training to improve management of pediatric overweight.* Journal of Continuing Education in the Health Professions, 2005. **25**(4).
197. Hinchman, J., et al., *Evaluation of a training to improve management of pediatric overweight.* Journal of Continuing Education in the Health Professions, 2005. **25**(4).
198. Bailey-Davis, L., et al., *Feasibility of enhancing well-child visits with family nutrition and physical activity risk assessment on body mass index.* Obesity Science & Practice, 2019. **5**(3): p. 220-230.
199. Park, M.H., et al., *Development and evaluation of an online tool for management of overweight children in primary care: a pilot study.* BMJ Open, 2015. **5**(6): p. e007326.
200. Sharpe, L., et al., *Quick Screen to Intervene: Starting the Conversation About Pediatric Obesity.* The Journal for Nurse Practitioners, 2016. **12**(10): p. e431-e434.
201. Polacsek, M., et al., *Impact of a Primary Care Intervention on Physician Practice and Patient and Family Behavior: Keep ME Healthy—The Maine Youth Overweight Collaborative.* Pediatrics, 2009. **123**(Supplement_5): p. S258-S266.
202. Gibson, S.J., *Translation of clinical practice guidelines for childhood obesity prevention in primary care mobilizes a rural Midwest community.* Journal of the American Association of Nurse Practitioners, 2016. **28**(3): p. 130-137.
203. Camp, N.L., et al., *Modifying Provider Practice To Improve Assessment of Unhealthy Weight and Lifestyle in Young Children: Translating Evidence in a Quality Improvement Initiative for At-Risk Children.* Childhood Obesity, 2017. **13**(3): p. 173-181.
204. Karacabeyli, D.S., S.; Keidar, S.; Pinkney, S.; Bepple, K.; Edwards, D.; Hale, I.; Suleman, S.; Amed, S, *The live 5-2-1-0 toolkit for family physicians: Mixed methods evaluation of a resource to facilitate health promotion in a primary care setting.* British Columbia Medical Journal, 2020. **62**(6): p. 196-201.
205. Camp, N.L., R.C. Robert, and K.P. Kelly, *Healthy Habits Questionnaire Feasibility and Utility for High-Risk Children.* Clinical Pediatrics, 2020. **59**(11): p. 978-987.
206. Shook, R.P., et al., *Adherence With Multiple National Healthy Lifestyle Recommendations in a Large Pediatric Center Electronic Health Record and Reduced Risk of Obesity.* Mayo Clinic Proceedings, 2018. **93**(9): p. 1247-1255.
207. Christison, A.L., et al., *Pairing Motivational Interviewing with a Nutrition and Physical Activity Assessment and Counseling Tool in Pediatric Clinical Practice: A Pilot Study.* Childhood Obesity, 2014. **10**(5): p. 432-441.
208. Herbenick, S.K., et al., *Effects of family nutrition and physical activity screening for obesity risk in school-age children.* Journal for Specialists in Pediatric Nursing, 2018. **23**(4): p. e12229.
209. Savage, J.S., et al., *A patient-centered, coordinated care approach delivered by community and pediatric primary care providers to promote responsive parenting: pragmatic randomized clinical trial rationale and protocol.* BMC Pediatrics, 2018. **18**(1): p. 293.
210. McKee, M.D., et al., *Counseling to Prevent Obesity Among Preschool Children: Acceptability of a Pilot Urban Primary Care Intervention.* The Annals of Family Medicine, 2010. **8**(3): p. 249-255.

211. Andrade, L., et al., *Beyond BMI: a feasibility study implementing NutriSTEP in primary care practices using electronic medical records (EMRs).* Health Promot Chronic Dis Prev Can, 2020. **40**(1): p. 1-10.
212. Dunlop, A.L., et al., *Improving Providers' Assessment and Management of Childhood Overweight: Results of an Intervention.* Ambulatory Pediatrics, 2007. **7**(6): p. 453-457.
213. Woolford, S.J., et al., *Feasibility and Acceptability of a 1-Page Tool to Help Physicians Assess and Discuss Obesity With Parents of Preschoolers.* Clinical Pediatrics, 2009. **48**(9): p. 954-959.
214. Watson-Jarvis, K., et al., *Implementing the Nutrition Screening Tool for Every Preschooler (NutriSTEP®) in community health centres.* Can J Diet Pract Res, 2011. **72**(2): p. 96-8.
215. Watson-Jarvis, K.R.D.M.N.S.F.D.C., et al., *Preschool Nutrition Risk in Calgary.* Canadian Journal of Dietetic Practice and Research, 2011. **72**(1): p. e101-6.
216. Gance-Cleveland, B., et al., *Decision Support to Promote Healthy Weights in Children.* The Journal for Nurse Practitioners, 2014. **10**(10): p. 803-812.
217. Gibson, J.S., *Translation of clinical practice guidelines for childhood obesity prevention in primary care mobilizes a rural Midwest community.* Journal of the American Association of Nurse Practitioners, 2016. **28**(3).
218. Williams, A., et al., *Adoption of an Electronic Medical Record Tool for Childhood Obesity by Primary Care Providers.* Appl Clin Inform, 2020. **11**(02): p. 210-217.
219. Ihmels, M.A., et al., *Development and preliminary validation of a Family Nutrition and Physical Activity (FNPA) screening tool.* Int J Behav Nutr Phys Act, 2009. **6**: p. 14.
220. Ihmels, M.A., et al., *Prediction of BMI change in young children with the family nutrition and physical activity (FNPA) screening tool.* Ann Behav Med, 2009. **38**(1): p. 60-8.
221. Randall Simpson, J.A., et al., *Nutrition Screening Tool for Every Preschooler (NutriSTEP): validation and test-retest reliability of a parent-administered questionnaire assessing nutrition risk of preschoolers.* Eur J Clin Nutr, 2008. **62**(6): p. 770-80.
222. Jacobson Vann, J.C., et al., *Use of a tool to determine perceived barriers to children's healthy eating and physical activity and relationships to health behaviors.* J Pediatr Nurs, 2011. **26**(5): p. 404-15.
223. Webb, M.J., G. Wadley, and L.A. Sanci, *Experiences of general practitioners and practice support staff using a health and lifestyle screening app in primary health care: Implementation case study.* JMIR mHealth and uHealth, 2018. **6**(4): p. e8778.
224. Nilsen, P., et al., *Effectiveness of strategies to implement brief alcohol intervention in primary healthcare: a systematic review.* Scandinavian journal of primary health care, 2006. **24**(1): p. 5-15.
225. Reay, T., et al., *Legitimizing new practices in primary health care.* Health Care Management Review, 2013. **38**(1): p. 9-19.
226. Iragorri, N. and E. Spackman, *Assessing the value of screening tools: reviewing the challenges and opportunities of cost-effectiveness analysis.* Public health reviews, 2018. **39**: p. 1-27.
227. Lee, S.H., et al., *The use of virtual nominal groups in healthcare research: An extended scoping review.* PLOS ONE, 2024. **19**(6): p. e0302437.
228. Miro. *Miro Board*. 2025; Available from: https://miro.com/.
229. Government of South Australia., *Sitting Fees and Reimbursement for External Individuals Policy*, S. Health, Editor. 2021.
230. Krijger, A., et al., *A lifestyle screening tool for young children in the community: needs and wishes of parents and youth healthcare professionals.* BMC Health Services Research, 2024. **24**(1): p. 584.
231. Krijger, A., et al., *Development and evaluation study of FLY-Kids: a new lifestyle screening tool for young children.* Eur J Pediatr, 2023.

232. Gooey, M., et al., *Childhood obesity prevention in general practice: supporting implementation through co-ideation.* Family practice, 2024. **41**(1): p. 25-30.
233. Gooey, M., et al., *Preventing childhood obesity in general practice: a qualitative study of GPs, practice nurses, and practice managers.* Family Practice, 2024. **41**(5): p. 770-780.
234. Peters, S., et al., *Facilitating Guideline Implementation in Primary Health Care Practices.* Journal of Primary Care & Community Health, 2020. **11**: p. 2150132720916263.
235. Bradbury, D., et al., *Barriers and facilitators to health care professionals discussing child weight with parents: A meta-synthesis of qualitative studies.* British Journal of Health Psychology, 2018. **23**(3): p. 701-722.
236. Hearn, L., M. Miller, and D. Cross, *Engaging Primary Health Care Providers in the Promotion of Healthy Weight among Young Children: Barriers and Enablers for Policy and Management.* Australian Journal of Primary Health, 2007. **13**(2): p. 66-79.
237. Ahern, S., et al., *Communication strategies and effectiveness of early childhood obesity-related prevention programs for linguistically diverse communities: A rapid review.* Obesity Reviews, 2023. **24**(12): p. e13634.
238. Rossiter, C., et al., *Australian parents' experiences with universal child and family health services.* Collegian, 2019. **26**(3): p. 321-328.
239. Movsisyan, A., et al., *Adapting evidence-informed complex population health interventions for new contexts: a systematic review of guidance.* Implementation Science, 2019. **14**: p. 1-20.
240. Alexander, K.E. and D. Mazza, *Scrapping the healthy kids check: a lost opportunity.* The Medical Journal of Australia, 2015. **203**(8): p. 321-322.
241. Australian Institute of Health and Welfare. *A profile of primary health care nurses*. 2020; Available from: https://www.aihw.gov.au/reports/primary-health-care/a-profile-of-primary-care-nurses/contents/primary-health-care-nurses.
242. Dutch D, B.L., Hunter SC, Johnson BJ, Denney-Wilson E, and Golley RK, *Australian primary health care guidelines for childhood growth, health and development: A scoping review.* Australian and New Zealand Journal of Public Health, (under review).
243. Dutch D, H.S., Bell L, Manson AC, Denney-Wilson E, and Golley RK., *Child health behaviour screening in Primary Health Care: Nominal Group Technique workshops with Australian practitioners.* Primary Health Care Research & Development, (under review).
244. Bell, L., et al., *Development and validation of a short dietary questionnaire for assessing obesity-related dietary behaviours in young children.* Maternal & Child Nutrition, 2024. **20**(2): p. e13613.
245. Trost, S.G., et al., *Reliability and validity of rapid assessment tools for measuring 24-hour movement behaviours in children aged 0–5 years: the Movement Behaviour Questionnaire Baby (MBQ-B) and child (MBQ-C).* International Journal of Behavioral Nutrition and Physical Activity, 2024. **21**(1): p. 43.
246. Byrne, R., C.O. Terranova, and S.G. Trost, *Measurement of screen time among young children aged 0–6 years: A systematic review.* Obesity reviews, 2021. **22**(8): p. e13260.
247. Byrne, R., et al., *Cognitive Testing of Items Measuring Movement Behaviours in Young Children Aged Zero to Five Years: Development of the Movement Behaviour Questionnaires for -Baby (MBQ-B) and -Child (MBQ-C).* Children, 2023. **10**(9): p. 1554.
248. Zarnowiecki, D., et al., *Improving the reporting of young children's food intake: Insights from a cognitive interviewing study with mothers of 3–7-year old children.* Nutrients, 2020. **12**(6): p. 1645.
249. Byrne, R., et al. *Insights from cognitive interviewing in the development of rapid assessment tools that measure obesity-related behaviours in children aged 0-5*

years. in *Abstract book for the ISBNPA 2022 Annual Meeting*. 2022. International Society of Behavioral Nutrition and Physical Activity.
250. Sekhon, M., M. Cartwright, and J.J. Francis, *Development of a theory-informed questionnaire to assess the acceptability of healthcare interventions.* BMC health services research, 2022. **22**(1): p. 279.
251. IBM Corp, *IBM SPSS Statistics for Windows (Version 28.0)*. 2021: Armonk, NY.
252. Schroth, R.J., et al., *A mixed methods approach to obtaining health care provider feedback for the development of a Canadian pediatric dental caries risk assessment tool for children< 6 years.* Frontiers in Oral Health, 2023. **4**: p. 1074621.
253. Baker, J., et al., *The acceptability and effectiveness of web-based developmental surveillance programs: rapid review.* JMIR mHealth and uHealth, 2020. **8**(4): p. e16085.
254. Johnson, P.R., et al., *Usability and acceptability of a text message-based developmental screening tool for young children: pilot study.* JMIR pediatrics and parenting, 2019. **2**(1): p. e10814.
255. Lee, M.D., et al., *Participant and caregiver perspectives on health feedback from a healthy lifestyle check.* Health Expectations, 2024. **27**(1): p. e13960.
256. Appleton, J., et al., *Infant formula feeding practices and the role of advice and support: An exploratory qualitative study.* BMC pediatrics, 2018. **18**: p. 1-11.
257. House, E.T., et al., *A comparison of early childhood obesity prevention in Australian general practice and child and family health settings: A mixed methods study.* Journal of Pediatric Nursing, 2025. **81**: p. 97-107.
258. Powell, B.J., et al., *A refined compilation of implementation strategies: results from the Expert Recommendations for Implementing Change (ERIC) project.* Implementation Science, 2015. **10**(1): p. 21.
259. Skivington, K., et al., *A new framework for developing and evaluating complex interventions: update of Medical Research Council guidance.* bmj, 2021. **374**.
260. Craig, P., et al., *Developing and evaluating complex interventions: the new Medical Research Council guidance.* Bmj, 2008. **337**.
261. Craig, P. and M. Petticrew, *Developing and evaluating complex interventions: reflections on the 2008 MRC guidance.* International journal of nursing studies, 2013. **50**(5): p. 585-587.
262. Campbell, M., et al., *Framework for design and evaluation of complex interventions to improve health.* Bmj, 2000. **321**(7262): p. 694-696.
263. Landes, S.J., S.A. McBain, and G.M. Curran, *An introduction to effectiveness-implementation hybrid designs.* Psychiatry Research, 2019. **280**: p. 112513.
264. Proctor, E.K., et al., *Implementation research in mental health services: an emerging science with conceptual, methodological, and training challenges.* Administration and Policy in Mental Health and Mental Health Services Research, 2009. **36**: p. 24-34.
265. House, E.T., et al., *219 - Identifying primary health professionals' training needs to support early childhood obesity prevention in Australia.* Obesity Research & Clinical Practice, 2024. **18**(5, Supplement 1): p. S41.
266. The Australian Prevention Partnership Centre. *Implementing policies and programs in chronic disease prevention: synthesis summary*. 2024 [cited 2025; Available from: https://preventioncentre.org.au/wp-content/uploads/2024/02/Implementation-Research-Synthesis-Summary-March-2024.pdf.
267. The Royal Australian College of General Practitioners. *Healthy Habits*. 2025 [cited 2025; Available from: https://healthyhabits.racgp.org.au/.
268. Adelaide PHN. *HealthPathways SA*. 2025 [cited 2025; Available from: https://adelaidephn.com.au/supporting-primary-care/healthpathways-sa.
269. New South Wales Government. *Healthy kids for professionals*. 2025 [cited 2025; Available from: https://pro.healthykids.nsw.gov.au/.
270. Health and Wellbeing Queensland. *Clinicians Hub*. 2020 [cited 2025; Available from: https://hw.qld.gov.au/hub/.

271. Schuler, B.R., C.E. Vazquez, and N. O'Reilly, *From childhood obesity risk to healthy growth in the U.S.: A 10-year social work research & policy update.* Preventive Medicine Reports, 2023. **31**: p. 102071.

10 APPENDICES

10.1 Summary list of Appendices

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Appendix 1: Co-authorship forms

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CO-AUTHORSHIP APPROVALS FOR HDR THESIS FOR EXAMINATIONS

In accordance with Clause 5, 7 and 8 in the HDR Thesis Rules, a student must sign a declaration that the thesis does not contain any material previously published or written by another person except where due reference is made in the text or footnotes. There can be no exception to this rule.

a. Publications or significant sections of publications (whether accepted, submitted or in manuscript form) arising out of work conducted during candidature may be included in the body of the thesis, or submitted as additional evidence as an appendix, on the following conditions:
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   II. they are formatted in the same way as the other chapters (i.e. not presented as reprints unless as an appendix), whether included as separate chapters or integrated into chapters
   III. they are in the same typeface as the rest of the thesis (except for reprints included as an appendix)
   IV. published and unpublished sections of a chapter are clearly differentiated with appropriate referencing or footnotes, and
   V. unnecessary repetition in the general introduction and conclusion, and the introductions and conclusions of each published chapter, is avoided.

b. Multi-author papers may be included within a thesis, provided:
   I. the student is the primary author
   II. there is a clear statement in prose for each publication at the front of each chapter, recording the percentage contribution of each author to the paper, from conceptualisation to realisation and documentation.
   III. The publication adheres to Flinders Research Publication, Authorship and Peer Review Policy, and
   IV. each of the other authors provides permission for use of their work to be included in the thesis on the form below.

c. Papers where the student is not the primary author may be included within a thesis if a clear justification for the paper's inclusion is provided, including the circumstances relating to production of the paper and the student's position in the list of authors. However, it is preferable to include such papers as appendices, rather than in the main body of the thesis.

STUDENT DETAILS

Student Name	Dimity Dutch
Student ID	2150287
College	College of Nursing & Health Sciences
Degree	Doctor of Philosophy
Title of Thesis	Embedding children's health behaviour screening within routine primary health care as a strategy to support growth, health, and development in the early years

CO-AUTHORSHIP APPROVALS FOR HDR THESIS EXAMINATION

PUBLICATION 1

This section is to be completed by the student and co-authors. If there are more than four co-authors (student plus 3 others), only the three co-authors with the most significant contributions are required to sign below.

Please note: A copy of this page will be provided to the Examiners.

Full Publication Details	Dutch D, Bell L, Hunter SC, Johnson BJ, Denney-Wilson E, and Golley RK. Australian primary health care guidelines for childhood growth, health and development: A scoping review, Australian and New Zealand Journal of Public Health (accepted for publication)
Section of thesis where publication is referred to	Chapter 4: AUSTRALIAN PRIMARY HEALTH CARE GUIDELINES FOR CHILDHOOD GROWTH, HEALTH, AND DEVELOPMENT IN THE EARLY YEARS: A SCOPING REVIEW

Student's contribution to the publication

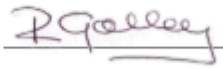
95	%	Research design
95	%	Data collection and analysis
90	%	Writing and editing

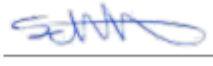
Outline your (the student's) contribution to the publication:

Co-author contributions: Dimity Dutch (DD) conducted document searches, data extraction and synthesis. Lucy Bell (LB), Sarah Hunter (SH), Brittany J Johnson (BJJ), Elizabeth Denney-Wilson (EDW) and Rebecca K Golley (RKG) provided study oversight, including agreement on included documents, data extraction, results synthesis, and interpretation. LB, SH, BJJ, EDW and RKG provided supervision and guidance to DD. DD drafted the manuscript, and all authors contributed to the interpretation of the results and critical review of the manuscript. All authors read and approved the final manuscript.

APPROVALS

By signing the section below, you confirm that the details above are an accurate record of the students contribution to the work.

Name of Co-Author 1 Rebecca Golley Signed  Date 2/6/25

Name of Co-Author 2 Sarah Hunter Signed  Date 2/6/25

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PUBLICATION 2

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Please note: A copy of this page will be provided to the Examiners.

Full Publication Details	Dutch D, Bell L, Zarnowiecki D, et al. Screening tools used in primary health care settings to identify health behaviours in children (birth–16 years): A systematic review of their effectiveness, feasibility and acceptability. Obesity Reviews. 2024; 25(4): e13694. https://doi.org/10.1111/obr.13694
Section of thesis where publication is referred to	Chapter 5: SCREENING TOOLS USED IN PRIMARY HEALTH CARE SETTINGS TO IDENTIFY HEALTH BEHAVIOURS IN CHILDREN (BIRTH-16 YEARS): A SYSTEMATIC REVIEW OF THEIR EFFECTIVENESS, FEASIBILITY AND ACCEPTABILITY

Student's contribution to the publication

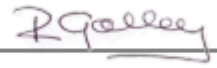
80	%	Research design
90	%	Data collection and analysis
90	%	Writing and editing

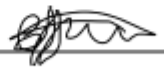
Outline your (the student's) contribution to the publication:

Co-author contributions: Rebecca K. Golley (RKG), Dorota Zarnowiecki (DZ), Kamila Davidson (KD), Elizabeth Denney-Wilson (EDW), Brittany J. Johnson (BJJ) and Lucinda Bell (LB) conceived the project and provided study oversight. With the assistance of a research librarian, DZ developed the search strategy and Dimity Dutch (DD) conducted the search. DD, Heilok Cheng (HC), Rebecca Byrne (RB), Chris Rossiter (CR), DZ, KD and Alexandra Manson (AM) carried out article screening, DD conducted data extraction, and DD and Eve House (EH) completed critical appraisal. DD, HC, EH, BJJ, LB and AM drafted the manuscript, and all authors contributed to the interpretation of results and critical review of the manuscript. All authors read and approved the final manuscript.

APPROVALS

By signing the section below, you confirm that the details above are an accurate record of the students contribution to the work.

Name of Co-Author 1 Rebecca Golley Signed  Date 2/6/25

Name of Co-Author 2 Brittany Johnson Signed  Date 2/6/25

Name of Co-Author 3 Lucinda Bell Signed  Date 3/6/25

PUBLICATION 3

This section is to be completed by the student and co-authors. If there are more than four co-authors (student plus 3 others), only the three co-authors with the most significant contributions are required to sign below.

Please note: A copy of this page will be provided to the Examiners.

Full Publication Details	Dutch D, Hunter SC, Bell L, Manson AC, Denney-Wilson E, and Golley RK. Child health behaviour screening in Primary Health Care: Nominal Group Technique workshops with Australian practitioners, Primary Health Care Research & Development (under peer-review)
Section of thesis where publication is referred to	Chapter 6: CHILD HEALTH BEHAVIOUR SCREENING IN PRIMARY HEALTH CARE: NOMINAL GROUP TECHNIQUE WORKSHOPS WITH AUSTRALIAN PRACTITIONERS

Student's contribution to the publication

95	%	Research design
90	%	Data collection and analysis
95	%	Writing and editing

Outline your (the student's) contribution to the publication:

Dimity Dutch (DD) facilitated all virtual workshops with the assistance of Alexandra Manson (AM) as notetaker. DD conducted analysis and synthesis of idea generation results and coordinated online voting. Lucy Bell (LB), Sarah Hunter (SH), Elizabeth Denney-Wilson (EDW) and Rebecca K Golley (RKG) provided supervision throughout the research process, including agreement on results synthesis and interpretation. DD drafted the manuscript. All authors contributed to reviewing, editing, and approving the final version of the paper.

APPROVALS

By signing the section below, you confirm that the details above are an accurate record of the students contribution to the work.

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Name of Co-Author 2	Sarah Hunter	Signed		Date	16/06/2025
Name of Co-Author 3	Rebecca Golley	Signed		Date	17/06/2025

CO-AUTHORSHIP APPROVALS FOR HDR THESIS EXAMINATION

PUBLICATION 4

This section is to be completed by the student and co-authors. If there are more than four co-authors (student plus 3 others), only the three co-authors with the most significant contributions are required to sign below.

Please note: A copy of this page will be provided to the Examiners.

Full Publication Details	Dutch D, Hunter SC, Bell L, Denney-Wilson E, and Golley RK. Caregiver acceptability and feasibility of child health behaviour screeening in Primary Health CARE: a multi-method pilot study at Health2Go (manuscript in preparation for submission to a peer-reviewed journal)
Section of thesis where publication is referred to	Chapter 7: CAREGIVER ACCEPTABILITY AND FEASIBILITY OF CHILD HEALTH BEHAVIOUR SCREENING IN PRIMARY HEALTH CARE – A MULTI-METHOD PILOT STUDY AT HEALTH2GO

Student's contribution to the publication

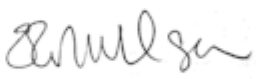
90	%	Research design
95	%	Data collection and analysis
95	%	Writing and editing

Outline your (the student's) contribution to the publication:

Dimity Dutch (DD) conducted all recruitment and data collection. Lucy Bell (LB), Sarah Hunter (SH), Elizabeth Denney-Wilson (EDW) and Rebecca K Golley (RKG) provided supervision throughout the research process, including agreement on results synthesis and interpretation. All authors contributed to reviewing, editing, and approving the final version of the paper.

APPROVALS

By signing the section below, you confirm that the details above are an accurate record of the students contribution to the work.

Name of Co-Author 1	Elizabeth Denney-Wilson	Signed		Date	17/06/2025
Name of Co-Author 2	Sarah Hunter	Signed		Date	16/06/2025
Name of Co-Author 3	Rebecca Golley	Signed		Date	17/06/2025

Appendix 2: Scoping Review Reporting Checklist (PRISMA-ScR) [146]

Section	Item	PRISMA-ScR Checklist Item	Thesis Section
Title	1	Identify the report as a scoping review	4.1
Abstract			
Structured Summary	2	Provide a structured summary that includes (as applicable) background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	4.2
Introduction			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	4.3
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	4.4
Methods			

Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	N/A
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	4.5.2
Information sources	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	4.5.3
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Table 9
Selection of sources of evidence	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review	4.5.4
Data charting process	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	4.5.5
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made	4.5.6

Critical appraisal of individuals sources of evidence	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	N/A
Summary measures	13	Not applicable for scoping reviews	N/A
Synthesis of results	14	Describe the methods of handling and summarizing the data that were charted.	4.5.6
Risk of bias across studies	15	Not applicable for scoping reviews	N/A
Additional analyses	16	Not applicable for scoping reviews	N/A
Results			
Selection of sources of evidence	17	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram	4.6.1
Characteristics of sources of evidence	18	For each source of evidence, present characteristics for which data were charted and provide the citations.	Table 10
Critical appraisal within sources of evidence	19	If done, present data on critical appraisal of included sources of evidence (see item 12)	N/A
Results of individual sources of evidence	20	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives	4.6
Synthesis of results	21	Summarize and/or present the charting results as they relate to the review questions and objectives.	4.6.2 & 4.6.3

Risk of bias across studies	22	Not applicable for scoping reviews	N/A
Additional analyses	23	Not applicable for scoping reviews	N/A
Discussion			
Summary of evidence	24	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	4.7
Limitations	25	Discuss the limitations of the scoping review process.	4.7.1
Conclusions	26	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	4.7.2
Funding	27	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	N/A

Appendix 3: Published Scoping Review Manuscript in *Australian and New Zealand Journal of Public Health*

Australian Primary Health Care guidelines for childhood growth, health, and development in the early years: A scoping review

Dimity Dutch,[1]* Lucinda Bell,[1] Sarah C. Hunter,[1] Brittany J. Johnson,[1] Elizabeth Denney-Wilson,[2] Rebecca K. Golley[1]

[1]Flinders University, College of Nursing and Health Sciences, Caring Futures Institute, Adelaide, SA, Australia
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Submitted: 18 August 2024; Revision requested: 13 February 2025; Accepted: 9 April 2025

Abstract

Objective: The aim of this study was to identify and synthesise recommendations for growth monitoring, health behaviour screening, and health promotion advice within current Australian documents that guide Primary Health Care practitioners to support childhood growth, health, and development in the early years.

Methods: Documents were identified using Google Advanced Search and targeted website searching. An iterative inductive and deductive content analysis was conducted and contextualised using the *5W (who, what, when, where, why) + 1H (how) framework*.

Results: All included documents (n = 18) recommended growth monitoring. Recommendations to screen and promote child health behaviours (diet, physical activity, sedentary behaviour, or sleep) were fragmented and provided limited guidance on *how* to screen and promote child health behaviours in practice.

Conclusions: Documents recognised the importance of screening and promoting child health behaviours in Primary Health Care; however, comprehensive recommendations were limited. Practical tools and resources are needed to enable Primary Health Care practitioners to conduct effective and appropriate screening and health promotion and across all four health behaviour domains.

Implications for Public Health: There is opportunity for guidelines to recommend and integrate health behaviour screening tools into routine PHC practice to better support children's growth, health, and development in the early years.

Key words: screening, monitoring, growth monitoring, health behaviours, health promotion, primary health care

Introduction

The early years (from birth to 5 years) are a critical stage of development, rapid growth, and laying foundations for behaviours that influence health including dietary intake, physical activity, sedentary behaviour, and sleep.[1–3] International guidelines[4] recognise the importance of establishing positive health behaviours in the early years to support optimal child and lifelong health given health behaviours track into adolescence and adulthood.[5,6] In Australia, there are several key national policy documents that support a focus on health promotion in the early years.[7–11] Briefly, key themes include improving the quality and access of integrated and universal health care and prioritising preventive health. The Australian Dietary Guidelines[12] and Australian 24-Hour Movement Guidelines for the Early Years (birth to 5 years)[13] provide national recommendations for a child's dietary intake, physical activity, sedentary behaviour, and sleep to support optimal growth, health, and development. Therefore, supporting children to establish positive health behaviours is a key preventive health strategy to enable children to have the best start to life and have long-term health impact.

Primary Health Care (PHC) is an umbrella term for the settings that children and caregivers access for preventive health care, including general practice, maternal and child health nurse clinics, community health services, and allied health settings. PHC in Australia is a familiar and valued setting for caregivers of young children due to the

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longitudinal and trusting relationships developed from regular encounters, particularly in the early years.[14] Regular encounters may include routine health checks, immunisation, and multi-disciplinary appointments, facilitated in general practice, allied health, and children and family health services, and enabled by standardised, evidence-based, screening and assessment tools.[15] Core elements of universal health services for children and families include growth, health, and developmental screening and monitoring, health promotion, early identification of family need and risk, and responding to identified need through education and intervention.[16] PHC is therefore an ideal and opportunistic setting for preventive practice and is essential for achieving a multi-disciplinary, holistic, and universal approach to support optimal growth, health, and development in the early years.

In Australia, maternal, child and family health services delivered by State and Territory Governments are a key provider of universal preventive health care to children and their families in the early years. However, 2023 data suggest that approximately 1.5 million Australian children aged 0–4 years visited a general practitioner, with an average of 5.7 consultations per child.[17] General practice and maternal, child and family health services are recognised as important for the provision of anticipatory guidance and health surveillance in young children.[18] However, given each Australian State and Territory deliver their own unique PHC services to children and families, the content and context of the tools and recommendations across different Australian jurisdictions may differ. Therefore, this review aimed to identify and synthesise current recommendations within Australian documents that guide PHC practitioners to screen and promote child health behaviours and growth in the early years (from birth to 5 years).

Methods

Study design

This qualitative study is an online desk-based scoping review and content analysis of Australian guidelines, frameworks, and documents that guide PHC practitioners when working with children and their caregivers in the early years (from birth to 5 years).

Reporting follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews[19] checklist (Supplementary Table 1).

Eligibility criteria

Population

Documents that included guidance for PHC practitioners (i.e. general practitioners, allied health practitioners, and maternal and child health nurses) on screening, monitoring, and health promotion advice related to children in the early years provided in Australian PHC settings were eligible for inclusion. Documents that included guidance for specialist or tertiary healthcare practitioners were not eligible for inclusion.

Outcomes of interest

Advice related to screening, monitoring, or surveillance of multiple health behaviour domains including dietary intake, physical activity, sedentary behaviour, and sleep was included. Advice related to growth monitoring was also included if other health behaviours were also described.

Document type

Australian national and state-/territory-level documents that provide guidance for PHC practitioners (e.g. child health records which are used to guide Australian PHC consultations in the early years) were eligible for inclusion.

Other

The searches were limited to documents published in English within the last 15 years (from 2007) to capture current (i.e. active) guideline and policy documents and a filter for region (Australia only) was applied. Only the latest and current version of documents were eligible for inclusion. Rescinded documents were not eligible for inclusion.

Search strategy and information sources

The search strategy for this review incorporated three strategies:

1. Google search engine (July–August 2022)
2. Target website searches (August–September 2022)
3. Consultation with experts (October 2022–December 2023)

The search was re-run in December 2024, and an updated version of two included guidelines were identified.

Google search terms

Search strategies were formulated considering sensitivity and specificity, to identify as many relevant records as possible to contribute to the review (sensitivity), while also balancing specificity and precision of the search terms so that screening was feasible.

Search terms were entered using Google Advanced Search. Search terms included:

- Health behaviours (i.e. diet, physical activity, sleep, and sedentary behaviour)
- Guidelines (i.e. practice guidelines, position statements, policy, advice recommendations, and frameworks)
- Children (i.e. infant, children, and toddler)
- Screening and monitoring

Details of the first 50 webpages of results were retrieved and checked against the eligibility criteria.

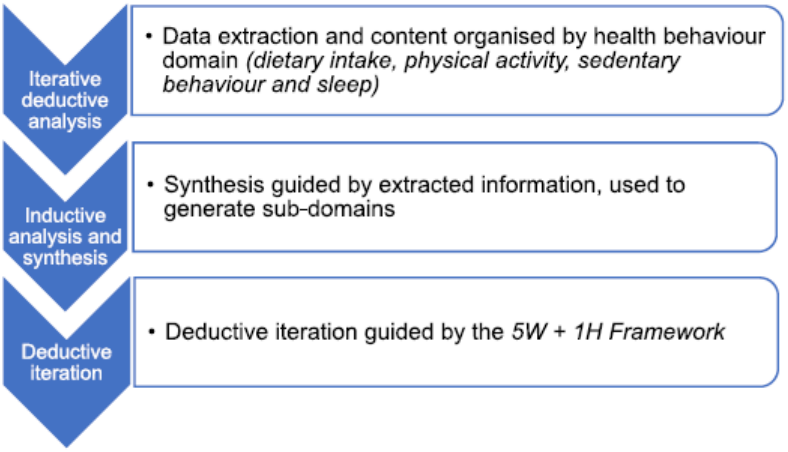
Targeted website searching

Based on previous PHC stakeholder mapping conducted by the research team in 2022 (Supplementary Table 2), the following stakeholder group websites were searched:

- Health practitioner associations/networks
- Australia state and federal government departments
- Non-government organisations
- Research organisations
- Community groups

Targeted website searching included searching the maternal, child and family health services of all Australian jurisdictions.

Figure 1: Three-stage approach for data analysis and synthesis. *5W + 1H = (who, what, when, where, why) + (how).*



Expert consultation

After collating the results from the Google Advanced Search and targeted website searching, researchers from the Centre for Research Excellence in Translating Early Promotion of Optimal Child Growth (https://earlychildhoodobesity.com/) were consulted to identify any additional documents for inclusion in the review. The Centre for Research Excellence in Translating Early Promotion of Optimal Child Growth is a multi-disciplinary network of leading researchers, practitioners, and policymakers across Australia and internationally with a mission to identify and implement effective approaches to promote child health behaviours in the early years.

Selection process

Document selection was undertaken by one researcher (Dimity Dutch) with expertise as a dietitian and experience conducting systematic reviews. Documents were screened against the a priori defined eligibility criteria in two stages: 1) webpage title and summary screening and 2) full webpage screening.

Data extraction

Data were extracted by one researcher (Dimity Dutch) with expertise as a dietitian and experience conducting systematic reviews. Data were extracted using Microsoft Excel (Version 2304). Data extraction tools were pilot tested and confirmed by the wider research team prior to use. Data extracted included descriptive information about the documents and recommendations provided within documents related to growth and child health behaviours. Descriptive document information included document name, author, URL, date of publication, target audience, and aim/s. Recommendations for health behaviour screening, health promotion advice, and recommendations for growth monitoring were extracted verbatim for comparison between documents. Data extraction was reviewed and confirmed by the entire research team.

Data analysis and synthesis

This review employed a content analysis and synthesis of text taken from online information sources; information sources being Australian documents that guide PHC practitioners to support child growth and health in the early years. This approach involved systematically analysing information in documents, with the aim of condensing and coding the documents to generate a list of themes, sub-themes, and synthesis of content.[20] A three-stage analysis approach (Figure 1) was required as knowledge of the health behaviour and growth monitoring screening and promotion recommendations in Australian practice guidelines is poor. Firstly, recommendations from the documents were extracted and organised by health behaviour domain (i.e. dietary intake, physical activity, sedentary behaviour, and sleep). Second, an inductive analysis and synthesis of extracted information generated sub-domains (i.e. milk feeding, amount of physical activity). Finally, data were synthesised using the *5W (who, what, when, where, why) + 1H (how) framework* to support a comprehensive understanding of the content and context of the included documents[21] (Supplementary Table 3). Data are presented as a narrative synthesis with a summary table of included practice guidelines, summary table of health behaviour screening recommendations, and summary table of health promotion advice. This approach supported understanding of what guiding information already exists and allowed for identification of gaps in information. This can subsequently enable the development of recommendations to improve guideline documents and thus ultimately improve practice within PHC.

Analysis and synthesis were conducted by one person (Dimity Dutch), with regular team analysis meetings occurring (Dimity Dutch, Rebecca K Golley, Sarah C Hunter, Brittany J Johnson, Elizabeth Denney-Wilson and Lucinda Bell) to clarify, refine, and achieve consensus on sub-themes and key findings. Dimity Dutch maintained a reflexive journal and in-depth record-keeping across all stages of data analysis.

Researcher positionality

The research team brings together expertise in public health (Rebecca K Golley, Lucinda Bell, BJ, Sarah C Hunter, Elizabeth Denney-Wilson and Dimity Dutch), dietetics (Rebecca K Golley, Lucinda Bell, Dimity Dutch and Brittany J Johnson), nursing (Elizabeth Denney-Wilson), and psychology (Sarah C Hunter). Data collection was conducted by

Dimity Dutch who is a white female and approached this research from a background in dietetics. Dimity Dutch is completing a PhD which is investigating embedding child health behaviour screening within routine PHC as a strategy to support optimal child growth, health, and development. The analysis team (Rebecca K Golley, Lucinda Bell, Sarah C Hunter, Brittany J Johnson and Elizabeth Denney-Wilson) comprised white females experienced in researching health behaviour measurement, public health interventions, implementation science, and research in PHC.

Results

Overall summary of documents

Figure 2 describes the Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow chart of the identification, screening, and number of included documents. See Supplementary Table 4 for individual search term combinations and google advanced searching results. Following screening, 18 documents were included in the review.

Table 1 describes the characteristics of national-[16,22–24] (n = 4), state-/territory-[25–30] (n = 6) and practice-level[31–38] (n = 8) documents included in the review that guide PHC practitioners to support optimal growth, health and development in the early years (from birth to 5 years). Three documents[22–24] were published by a non-government organisation, the Royal Australian College of General Practitioners, including one document specifically for Aboriginal and Torres Strait Islander people.[22] All other documents (n = 15) were published by Federal or State Health departments. Intended target audiences for documents included child, maternal and family health nurses, general practitioners, and other practitioners in PHC settings. For practice-level documents (n = 8), caregivers were an additional target audience. Intended PHC settings included both clinical practice and community health settings across metropolitan, rural, and remote Australia.

Health behaviour screening and growth monitoring recommendations

Eleven of the included documents provided recommendations for health behaviour screening across at least one domain—dietary intake, physical activity, sedentary behaviour, or sleep. Only two documents provided recommendations to screen across all four health behaviour domains, a Community Health Clinical Nursing Manual published by the Government of Western Australia[27] and the National guide to preventive healthcare for Aboriginal and Torres Strait Islander people (4th Edition).[22] Recommendations to screen for dietary behaviours was most common (n = 11), followed by sleep (n = 6), physical activity (n = 3) and sedentary behaviour (n = 3). All included documents provided recommendations for growth monitoring (n = 18). Recommendations are summarised using the *5W + 1H framework* (Supplementary Table 5).

Who

Recommendations for screening for dietary intake was targeted for both caregivers (n = 5) and practitioners (n = 6). Only three documents recommended screening for physical activity and/or sedentary behaviour and both were recommendations targeted for practitioners to conduct screening.[22,27,28] In contrast, within the

Figure 2: PRISMA flow chart of desk-based review search and included documents. PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

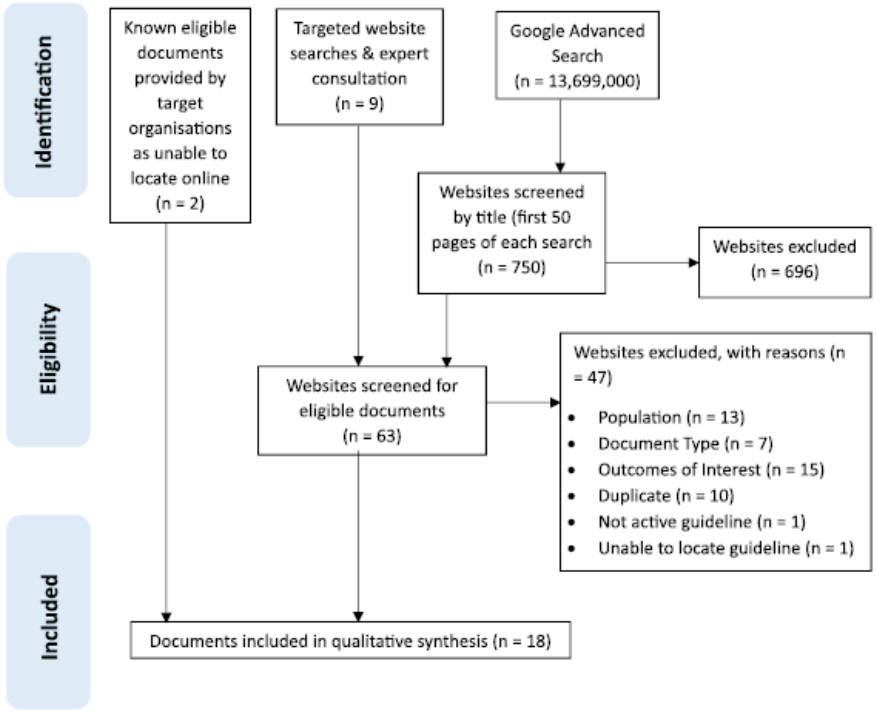


Table 1: Characteristics of documents that guide Primary Health Care (PHC) practitioners to support optimal growth, health, and development in the early years.

Document name	Author	Stakeholder sector and department	Year	Target PHC practitioners and intended child age	Recommendations for screening					Health Promotion advice				
					Diet n=10	PA n=3	SB n=3	Sleep n=5	Growth n=18	Diet n=18	PA n=15	SB n=10	Sleep n=15	Growth n=10
National documents (n = 4)														
1. National Framework for Universal Child and Family Health Services[16]	Australian Government, Department of Health and Ageing	Government, Health	2011	Child and family Health Nurses, General Practitioners and Allied Health Children aged 0–8 years	-	-	-	-	✓	✓	✓	-	-	-
2. Smoking, nutrition, alcohol and physical activity (SNAP): A population guide to the behavioural risk factors in general practice (2nd Edition)[a, 23]	Royal Australian College of General Practitioners (RACGP)	Non-government organisation	2015	General Practitioners and practice staff All ages, children aged 0–5 years included	-	-	-	-	✓	✓	✓	✓	-	✓
3. Guidelines for Preventive Activities in general practice (10th Edition) *(Red Book)*[a, 24]	GPRACGP	Non-government organisation	2024	General Practitioners All ages, children aged 0–5 years included	-	-	-	-	✓	✓	✓	✓	✓	-
4. National guide to preventive healthcare for Aboriginal and Torres Strait Islander people (4th Edition) [22]	National Aboriginal Community Controlled Health Organisation and GPRACGP	Non-government organisation	2024	Primary health care practitioners All ages, children aged 0–5 years included	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State/territory documents (n = 6)														
1. Maternal and child health service practice guidelines [30]	Victorian Government, Department of Health and Human Services	Government, Health	2009[b]	Maternal and child Nurses Children aged 0–5 years	✓	-	-	✓	✓	✓	-	-	✓	✓
2. Community Health Clinical Nursing Manual [27]	Government of Western Australia; Child and Adolescent Health Service	Government, Health	2017[c]	Child and adolescent Community Health Professionals Children aged 0–18 years	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3. Canberra Hospital and Health Services Clinical Procedure; Maternal and Child Health Procedures in the ACT [25]	ACT Government	Government, Health	2018	Maternal and child Nurses + midwives Children aged 0–6 years	-	-	-	-	✓	✓	-	-	✓	✓
4. Chronic Conditions Manual: Prevention and Management of Chronic Conditions in Rural and Remote Australia (2nd Edition) [28]	Queensland Health, Royal Flying Doctor Service (Queensland Section) and Apunipima Cape York Health Council	Government, Health	2020	Rural and remote healthcare practitioners All ages, children aged 0–5 years included	✓	✓	✓	-	✓	✓	✓	✓	✓	-

(continued)

Table 1. Continued

Document name	Author	Stakeholder sector and department	Year	Target PHC practitioners and intended child age	Recommendations for screening					Health Promotion advice				
					Diet n=10	PA n=3	SB n=3	Sleep n=5	Growth n=18	Diet n=18	PA n=15	SB n=10	Sleep n=15	Growth n=10
5. Child and Youth Health Practice Manual [26]	Queensland Child and Youth Clinics Network (Child Health sub-network), Queensland Health Queensland Hospital and Health Service	Government, Health	2020	General Practice, midwives, child health nurses, Aboriginal and Torres Strait Islander health practitioners, psychologists and social workers Children aged 0–18 years	-	-	-	-	✓	✓	✓	✓	✓	✓
6. Guideline: Assessing infant/child nutrition, growth and development, within the primary health care setting [29]	Queensland Government	Government, Health	2022	Primary health care practitioners Children aged 0–5 years	✓	-	-	-	✓	✓	✓	✓	✓	-
Practice level documents (n = 8)														
1. Purple Book [33]	Government of Western Australia, Child and Adolescent Health Service	Government, Health	2018	Caregiver and Practitioner Children aged 0–5 years	✓	-	-	-	✓	✓	✓	-	✓	-
2. My Child Health Record (Yellow Book) [35]	Northern Territory Government, Department of Health	Government, Health	2018	Caregiver and Practitioner Children aged 0–5 years	✓	-	-	✓	✓	✓	✓	✓	✓	-
3. My Health and Development Record (Blue Book) [32]	Government of South Australia, Child and Family Health Service	Government, Health	2021	Caregiver and Practitioner Children aged 0–5 years	✓	-	-	✓	✓	✓	-	-	✓	-
4. My personal health record (Blue Book) [34]	New South Wales Government, NSW Ministry of Health	Government, Health	2022	Caregiver and Practitioner Children aged 0–5 years	✓	-	-	-	✓	✓	✓	✓	✓	✓
5. Personal Health Record (Red Book)[d] [36]	Queensland Government, Queensland Health	Government, Health	2022	Caregiver and Practitioner Children aged 0–5 years	-	-	-	-	✓	✓	✓	✓	✓	✓
6. My Personal Health Record Book (Blue Book) [31]	Australian Capital Territory Government, ACT Health	Government, Health	2022	Caregiver and Practitioner Children aged 0–5 years	✓	-	-	✓	✓	✓	✓	-	✓	✓
7. My Health, Learning and Development Record (Green Book) [38]	Victorian Government, Department of Health	Government, Health	2022	Caregiver and Practitioner Children aged 0–5 years	-	-	-	-	✓	✓	✓	-	✓	-
8. Personal Health Record (Blue Book) [37]	Tasmanian Government, Tasmanian Health Service, Child Health and Parenting Service	Government, Health	2023	Caregiver Practitioner Children aged 0–5 years	✓	-	-	-	✓	✓	✓	-	✓	✓

Abbreviations: ACT = Australian Capital Territory; PA = physical activity; PHC = Primary Health Care; SB = sedentary behaviour.
[a]Supported by an implementation guide.[59]
[b]Reissued 2019 (without revision).
[c]First issued in 2017, then 2020/2022 (amendments).
[d]Supported by a parent information booklet.[60]

documents that recommended screening for sleep behaviours (n = 6), recommendations were predominantly targeted for caregivers.[30–32,35] Two documents provided recommendations for screening sleep behaviours targeted for the practitioner.[22,27]

Growth monitoring recommendations were predominantly targeted to practitioners (n = 16), except for two documents which encouraged caregivers to measure growth.[32,35]

What

For each health behaviour domain, documents included various sub-domains to review. For dietary intake, this included milk feeding (n = 10), solid food intake (n = 8), beverage intake (n = 5), elimination (n = 3), and caregiver concerns about child eating (n = 2). For physical activity, this included amount of physical activity (n = 3) and the type of physical activity (n = 1). For sedentary behaviour, this included amount of sedentary behaviour (n = 2) and reviewing screen time (n = 1). For sleep, this included sleep safety (n = 5), sleep routine and patterns (n = 2), caregiver concerns about child sleep (n = 2), and sleep settling (n = 1).

Growth monitoring was recommended in all documents through anthropometric measures including child weight, length, head circumference, waist circumference, and/or body mass index (BMI) from 2 years of age. Two documents recommended measurement of waist circumference[23,28] and fourteen documents recommended recording anthropometric measures in medical records,[23,26] electronic records,[26,27] or child health record.[25–27,29,31–38]

When

Screening for dietary intake behaviours was primarily recommended during child health checks (n = 9). Two documents recommended to screen dietary intake opportunistically,[22,29] while one document recommended screening for dietary intake annually.[28] Of the three documents that recommended screening for physical activity and sedentary behaviour, one included recommendations for screening opportunistically and annually,[22] one recommended screening during child health checks[27] and the other document did not specify when to screen.[28] Of the six documents that recommended screening for sleep behaviours, five recommended screening to occur as part of routine child health checks[27,30,31,34,35] and one recommended screening opportunistically.[22]

Monitoring growth, through child anthropometric measures, was most recommended during child health checks (n = 15). One document recommended growth monitoring opportunistically, annually and in line with immunisations,[22] one document described measuring growth every two years,[23] whilst two documents did not specify when to monitor growth.[16,38]

How

Screening recommendations typically described *"reviewing"* or *"assessing"* health behaviours in general, rather than screening using a specific tool. Only two documents referred to a health behaviour screening tool, including a safe sleeping checklist[30] and a sleep screening tool.[22] All other documents included either open-ended statements or questions (n = 4), tick-box yes/no response options (n = 4), or a combination of both (n = 3).

In contrast, growth monitoring had more specific recommendations on how to conduct screening, with 17 of the included 18 documents describing the use of age- and sex-specific growth charts as a strategy to monitor children's growth. Sixteen documents included the different versions of the growth charts, with (n = 12) or without (n = 4) information on how to plot, interpret, and assess outcomes.

Health behaviour and growth promotion advice

All documents included health promotion advice for dietary intake and at least one other health behaviour domain. Nine documents included health promotion advice for all four health domains, including two national documents,[22,24] four documents from Queensland[26,28,29,36] and one document each from Western Australia,[27] Northern Territory[35] and New South Wales.[34] Recommendations to provide health promotion advice for dietary intake was most common (n = 18), followed by sleep (n = 16), physical activity (n = 15), and sedentary behaviour (n = 10). Only 10 documents included recommendations to discuss growth promotion advice with caregivers.[22,23,25–27,30,31,34,36,37] Recommendations are summarised using the *5W + 1H framework* (Supplementary Table 6).

Who

Within national and state/territory documents, all health behaviour and growth promotion advice recommendations were targeted to practitioners. In contrast, health behaviour and growth promotion advice within practice-level child health records were targeted to caregivers.

What

Health promotion advice for dietary intake included promoting and supporting milk feeding (n = 17), introduction of solids (n = 16), promoting nutrition (n = 15), parenting practices (n = 5), and discussing allergy prevention (n = 5). Health promotion advice for physical activity included promoting physical activity and active play as per national guidelines (n = 11). For sedentary behaviour, health promotion advice included discussing screentime and quality of sedentary behaviour activities (n = 2), whilst for sleep, health promotion advice included discussing safe sleeping (n = 13), sleep settling (n = 8), and sleep routine (n = 7).

Growth promotion advice included discussing weight-based monitoring (n = 9) by discussing growth patterns and findings, as well as promoting a healthy BMI.

When

Documents recommended providing health promotion advice during child health checks (n = 12), opportunistically (n = 3), in line with immunisations (n = 2), or did not specify when to provide advice (n = 9).

Two documents recommended providing health promotion advice about dietary intake opportunistically,[22,29] whilst one document recommended providing health promotion advice about physical activity in line with immunisations in addition to during child health checks.[24] Six documents provided health promotion advice with no indication of when to provide it.[16,22,23,26,28,34]

Discussing growth was commonly recommended to occur during child health checks (n = 7),[22] opportunistically, in line with immunisations, or not specified (n = 3).

How

Most documents that included health promotion recommendations provided context or specific strategies on how to improve child health behaviours. For dietary intake, this included promoting healthy foods and beverages and limiting discretionary choices. For two documents, dietary advice was provided in the context of supporting oral health.[22,37] For physical activity, sedentary behaviour, and sleep, documents commonly included age-specific daily recommendations in line with national guidelines. Documents also included specific strategies to improve the quality of a child's physical activity and sedentary behaviours including encouraging supervised floor-based play,[22–24,28,29,31,33,34,36–38] active games[31,33,35,37,38] and non–screen-based activities such as reading and puzzles.[26–28,34] Health promotion strategies to improve child sleep included discussing[22] sleep routines[25–27,30–32,37] and settling strategies.[25,30,36,37]

Strategies on how to discuss growth with caregivers was included in seven documents[22,23,25–27,36,37] and included discussing growth and BMI in the context of factors influencing growth including child health behaviours, genetics, and environmental factors. Two documents also highlighted the importance of using non-stigmatising language and avoiding terms such as *"obese"* when discussing weight-based outcomes.[23,27]

Discussion

The purpose of this review was to identify and synthesise recommendations within current Australian documents that guide PHC practice for growth monitoring, health behaviour screening, and health promotion advice in the early years (from birth to 5 years). Growth monitoring was identified as a key responsibility for PHC and was recommended in all 18 documents.[16,22–38] Recommendations to screen and promote child health behaviours were also identified in all 18 documents; however, few documents included recommendations across all four health behaviour domains. Utilising the *5W + 1H framework* to synthesise and contextualise guideline recommendations, our results demonstrate that compared to measuring growth, recommendations to screen and promote child health behaviours are fragmented and incomplete. Although guidelines recognise health promotion advice and screening as important responsibilities of PHC, comprehensive recommendations to support all four health behaviour domains are lacking and vary across Australian jurisdictions.

Growth monitoring was identified as a key responsibility in PHC and was recommended in all 18 documents in this review. In Australia, national guidelines for general practice and universal child and family health services recommend using growth charts published by the World Health Organisation or Centers for Disease Control.[16,24] Growth charts are a traditional approach to monitoring child growth, health, and development, with anthropometry, including child weight, being a well-recognised objective and clinical measure. It is therefore no surprise that growth monitoring was recommended within all guideline documents in this review, consistent with findings from Gooey et al. who explored international clinical practice guidelines.[39] Despite this, there is a lack of high-level evidence supporting the effectiveness of routine growth monitoring due to the considerable complexity in accurately measuring, plotting, and interpreting child growth and communicating these findings sensitively and appropriately to caregivers.[39–45] Growth charts do not consider ethnic or genetic characteristics and are a proxy measure of a child's health and their health behaviours. There is also the risk of anxiety, stigma, and reluctance from both practitioners and caregivers to have weight-focussed conversations.[42,45–50] Only two documents within the review highlighted the importance of avoiding weight-focussed conversations; however, these documents lacked practical recommendations on how to have non-stigmatising conversations in practice.[23,27] The sensitive nature of these conversations can impact rapport and engagement, and without appropriate guidance for practitioners on how to communicate growth monitoring observations in practice, caregivers may not understand what the measurements mean in the context of their child's overall health.[51]

In addition to growth monitoring, documents identified in this review recommended screening child health behaviours; however, the recommendations were fragmented and incomplete, with only two documents providing recommendations across all four health behaviour domains.[22,27] Screening for a child's dietary intake, physical activity, sedentary behaviour, and sleep provides an opportunity to comprehensively understand child health behaviours and provide individualised advice. This approach also has potential to address known barriers and limitations of growth monitoring, including impact on stigma and rapport, and be an acceptable and feasible approach in PHC.[52,53] Interestingly, specific tools to support practitioners to comprehensively screen for child health behaviours were not included or recommended in guidelines. Two screening tools were identified in this review; however, they only captured one health behaviour domain, sleep.[22,30] This highlights the need for the development or integration of a suitable screening tool that measures all child health behaviour domains in Australian PHC.

Providing health promotion advice was identified as another key responsibility of PHC in addition to growth monitoring and screening for child health behaviours. Health promotion advice included within documents reflects opportunities for PHC practitioners to support families to improve child health behaviours to meet evidence-based and age-specific guidelines. Similar to child health behaviour screening recommendations, documents in this review also lacked consistent and comprehensive health promotion advice across all four health behaviour domains. Furthermore, the recommendations were typically generic statements to promote or discuss a particular health behaviour rather than strategies to provide tailored and individualised advice to caregivers. The *5A (ask, assess, advise, assist/agree and arrange) framework* is an internationally accepted framework for organising the assessment and management of modifiable risk factors and facilitating health behaviour change in PHC.[24] In line with this framework, practitioners should first engage in asking about or assessing a health behaviour prior to providing advice. Tailored health promotion advice that considers the families social and cultural context is also more likely to be acceptable and practical for caregivers than generic health promotion information.[54] Due to their interrelated and collective importance, revised guidelines need to recognise the importance of health promotion across all four health behaviour domains and include practical advice and strategies for practitioners to suggest in practice.[30]

The context in which health behaviour screening and promotion occurs is important. This includes who is responsible and where and when these preventive activities occur. Recommendations within the included documents in this review were either targeted at the caregiver as a preconsult screening question or targeted at the PHC

practitioner to discuss during the consult. Recommendations on when to screen or promote child health behaviours also varied across documents, including opportunistically, annually, at the practitioner's discretion (i.e. not specified), or during routine child health checks. Child health checks are conducted at regular touch points within the first five years of life and were the most recommended time to screen and promote child health behaviours. This demonstrates a prime opportunity to incorporate child health behaviour screening into routine practice at these well-established touchpoints. However, to support uptake, implementation, effectiveness, and sustainability in practice, accompanying resources are required.[52,53] This includes practitioner and caregiver resources, practitioner education, additional consultation time, referral pathways, and practitioner incentives.[39,55,56] Understanding the context is important for informing screening tool design as well as the resources and supports required to implement, embed, and sustain health behaviour screening in practice. Meaningful stakeholder engagement and partnerships with a range of PHC practitioners are required to develop and integrate fit-for-purpose screening tools and accompanying resources into routine PHC practice.[39,52,53]

Strengths and considerations

Strengths of this review include a rigorous and comprehensive search strategy to capture documents relevant for child health behaviours in the early years. This provided a thorough understanding of the Australian national and state/territory context for PHC practice in the early years. The inclusion of child health records from every Australian jurisdiction also provides a unique insight into the documents that guide consults between caregivers and maternal, child and family health nurses in practice. Utilising a content analysis supported by the *5W + 1H framework* to describe and synthesise recommendations is another key strength of this review as it aligns with the context in which information is communicated to PHC practitioners. Due to the scope of this review and the variety of included documents, the quality of documents was not examined using a critical appraisal checklist. Lastly, most of the screening and extraction was done by one reviewer; however, the synthesis and interpretation of results was confirmed with the wider review team.

Implications for future research, policy, and practice

Findings from this review provide tangible implications to improve current recommended practice for preventive care in the early years. Child health behaviour screening aligns with national policy priorities and with recommendations within current guidelines. Guidelines are a key implementation mechanism to translate policy priorities and recommendations into practice.[57,58] Our findings signal an opportunity to revise PHC guidelines to include child health behaviour screening and promotion advice across all four health behaviour domains to better support practitioners to provide consistent preventive care across all Australian jurisdictions. Practical screening tools for measuring child health behaviours would enable practitioners and caregivers to initiate and engage in individualised and culturally appropriate health behaviour–focussed conversations and monitor children's health behaviours overtime at both an individual and population level. Child health behaviour screening tools exist internationally[52,53]; however, there is limited literature exploring the effectiveness of screening, and currently available screening tools have not been tested in Australian PHC settings. Future research is required to explore Australian PHC practitioner and caregiver perspectives on child health behaviour screening including the feasibility and acceptability of this approach. Furthermore, the perspectives of culturally and linguistically diverse families should be explored. The effectiveness of child health behaviour screening should also be examined, including impact on short- and longer-term child health outcomes, as well as the implementation strategies and resources required to embed screening into PHC practice. Child health behaviour screening also has potential as a screening approach in other early-years settings and sectors including early education and care, and community services.

Conclusion

Screening and promoting children's health behaviours and growth are key preventive responsibilities for PHC and are recommended within national-, state-/territory-, and practice-level guiding documents. Current practice in Australia for monitoring and promoting children's health behaviours is reliant on PHC practitioners initiating health behaviour conversations informed by growth monitoring charts. There is a need to develop and incorporate evidence-based, practical screening tools into PHC guidelines, policy, and practice resources to support PHC practitioners to monitor and promote child health behaviours in the early years consistently and appropriately. Screening for child health behaviours could inform tailored advice and reduce weight-focussed conversations, which are known to be stigmatising and impacting rapport between caregivers and PHC practitioners. By embedding child health behaviour screening tools into routine child health and development checks, PHC practitioners can better support childhood growth, health, and development in the early years.

Conflicts of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

1. Birch L, Savage JS, Ventura A. Influences on the development of children's eating behaviours: from infancy to adolescence. *Can J Diet Pract Res* 2007; **68**(1):s1–56.
2. Kuzik N, Poitras VJ, Tremblay MS, Lee EY, Hunter S, Carson V. Systematic review of the relationships between combinations of movement behaviours and health indicators in the early years (0-4 years). *BMC Public Health* 2017;**17**(Suppl 5):849.

3. Wang L, Jansen W, van Grieken A, Vlasblom E, Boere-Boonekamp MM, L'Hoir MP, et al. Identifying patterns of lifestyle behaviours among children of 3 years old. *Eur J Publ Health* 2020;**30**(6):1115–21.
4. World Health Organisation. Guidelines on physical activity, sedentary behaviour and sleep for children under 5 years of age. *Geneva* 2019.
5. Craigie AM, Lake AA, Kelly SA, Adamson AJ, Mathers JC. Tracking of obesity-related behaviours from childhood to adulthood: a systematic review. *Maturitas* 2011;**70**(3):266–84.
6. Wang Y, Bentley ME, Zhai F, Popkin BM. Tracking of dietary intake patterns of Chinese from childhood to adolescence over a six-year follow-up period. *J Nutr* 2002;**132**(3):430–8.
7. Commonwealth of Australia. Australia's Long Term National Health Plan - to build the world's best health system. In: *Department of health*. DoH; 2019.
8. Commonwealth of Australia. National action plan for the health of children and young people 2020-2030. In: *Department of health*. Canberra: DoH; 2019.
9. Commonwealth of Australia. National preventive health strategy 2021-2030. In: *Department of health (DoH)*; 2021.
10. Commonwealth of Australia. Future focused primary health care: Australia's Primary Health Care 10 Year Plan 2022-2032. In: *Department of health (DoH)*; 2022.
11. Australian Government. Early years strategy 2024-2034. In: *Services DoS*; 2024.
12. National Health and Medical Research Council. *Australian dietary guidelines*. Canberra: NHMRC; 2013.
13. Department of Health. *Australian 24 Hour movement guidelines for the early years (birth to 5 years)*. 2017.
14. Australian Institute of Health and Welfare. *Primary health care in Australia*. AIHW; 2016 [Available from: https://www.aihw.gov.au/reports/primary-health-care/primary-health-care-in-australia/contents/about-primary-health-care.
15. Mayne SL, Hannan C, Faerber J, Anand R, Labrusciano-Carris E, DiFiore G, et al. Parent and primary care provider priorities for wellness in early childhood: a discrete choice experiment. *J Child Fam Stud* 2021;**30**(9):2238–49.
16. Australian Health Ministers Advisory Council. The national framework for universal child and family health services. In: *Australian government department of health and ageing*; 2011. Canberra.
17. Australian Government. *General practice workforce providing primary care services in Australia*. 2024 [3]. Available from: https://hwd.health.gov.au/resources/data/gp-primarycare.html.
18. Grant J, Mitchell C, Cuthbertson L. *National standards of practice for maternal, child and family health nursing practice in Australia*. 2017. Adelaide.
19. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 2018;**169**(7):467–73.
20. Green JT,N. *Qualitative methods for health research*. 4th ed. 2018.
21. Jia C, Cai Y, Yu YT, Tse T. 5W+ 1H pattern: a perspective of systematic mapping studies and a case study on cloud software testing. *J Syst Software* 2016;**116**:206–19.
22. National Aboriginal Community Controlled Health Organisation and The Royal Australian College of General Practitioners. National guide to preventive healthcare for Aboriginal and Torres Strait Islander people. In: *RACGP*. 4th ed. 2024. East Melbourne, Victoria.
23. The Royal Australian College of General Practitioners. Smoking, nutrition, alcohol, physical activity (SNAP): a population guide to behavioural risk factors in general practice. In: *Racgp*. 2nd ed. ed 2015. Melbourne.
24. The Royal Australian College of General Practitioners. Guidelines for preventive activities in general practice. In: *Racgp*. 10th ed. 2024. East Melbourne, Victoria.
25. ACT Government. Canberra hospital and health services clinical procedure; maternal and child health procedures in the ACT. In: *ACT health*; 2018. Canberra.
26. Childrens Health Queensland Hospital and Health Service. Child and youth health practice manual. In: *Queensland child and youth clinical network - child health sub-network*; 2020. Queensland.
27. Government of Western Australia. Community health clinical nursing manual. In: *Child and adolescent health service*; 2017. Western Australia.
28. Queensland Health, Royal Flying Doctor Service (Queensland Section), Apunipima Cape York Health Council. Chronic conditions manual: prevention and management of chronic conditions in rural and remote Australia. In: *The rural and remote clinical support unit; torres and cape hospital and health service*. 2nd ed. Cairns; 2020.
29. State of Queensland. Guideline: assessing infant/child nutrition, growth, and development within the primary health care setting. In: *Queensland health*; 2022. Brisbane.
30. Victorian Government. *Maternal and child health services practice guidelines 2009*. Melbourne: Department of Health and Human Services; 2009.
31. ACT Government. My personal health record Book (Blue book). In: *ACT health*; 2022. Canberra.
32. Government of South Australia. My health and development record (Blue book). In: *Child and family health service*; 2021. South Australia.
33. Government of Western Australia. Purple book. In: *Child and adolescent health service*; 2018. Western Australia.
34. New South Wales Government. My personal health record (Blue Book). In: *NSW ministry of health*; 2022. New South Wales.
35. Northern Territory Government. My child health record (Yellow Book). In: *Department of health*; 2018. Northern Territory.
36. Queensland Government. Personal health record (red book). In: *Queensland health*; 2022. Queensland.
37. Tasmanian Government. Personal health record (Blue book). In: *Tasmanian health service: child health and parenting service*. Tasmania; 2023.
38. Victorian Government. *My health, learning and development record (Green Book)*. Victoria: Department of Health; 2022.
39. Gooey M, Skouteris H, Betts J, Hatzikiriakidis K, Sturgiss E, Bergmeier H, et al. Clinical practice guidelines for the prevention of childhood obesity: a systematic review of quality and content. *Obes Rev* 2022;**23**(10):e13492.
40. Ashworth A, Shrimpton R, Jamil K. Growth monitoring and promotion: review of evidence of impact. *Maternal & Child Nutrition* 2008;**4**(Suppl 1):86–117. Suppl 1.
41. Garner P, Panpanich R, Logan S. Is routine growth monitoring effective? A systematic review of trials. *Arch Dis Child* 2000;**82**(3):197–201.
42. Hale I, Jackson E. Evaluating routine pediatric growth measurement as a screening tool for overweight and obese status. *Can Fam Physician* 2021;**67**(3):161–5.
43. Hendrickson MA, Pitt MB. Three Areas where our growth chart conversations fall short-room to grow. *JAMA Pediatr* 2022;**176**(2):123–4.
44. de Onis M, Wijnhoven TM, Onyango AW. Worldwide practices in child growth monitoring. *J Pediatr* 2004;**144**(4):461–5.
45. McMeniman E, Moore R, Yelland M, McClure R. Childhood obesity: how do Australian general practitioners feel about managing this growing health problem? *Aust J Prim Health* 2011;**17**(1):60–5.
46. Robinson A, Denney-Wilson E, Laws R, Harris M. Child obesity prevention in primary health care: investigating practice nurse roles, attitudes and current practices. *J Paediatr Child Health* 2013;**49**(4):E294–9.
47. Laws R, Campbell KJ, van der Pligt P, Ball K, Lynch J, Russell G, et al. Obesity prevention in early life: an opportunity to better support the role of Maternal and Child Health Nurses in Australia. *BMC Nurs* 2015;**14**:26.
48. Mansoor Y, Hale I. Parent perceptions of routine growth monitoring: a scoping review. *Paediatr Child Health* 2021;**26**(3):154–8.
49. Turer CB, Upperman C, Merchant Z, Montaño S, Flores G. Primary-care weight-management strategies: parental priorities and preferences. *Acad Pediatr* 2016;**16**(3):260–6.
50. Denney-Wilson E, Cheng H, Eames-Brown R. *Exploring the infant feeding advice provided by child family health nurses in SLHD and SWSLHD: final report*. 2018.
51. Ben-Joseph EP, Dowshen SA, Izenberg N. Do parents understand growth charts? A national, internet-based survey. *Pediatrics* 2009;**124**(4):1100–9.
52. Dutch D, Bell L, Zarnowiecki D, Johnson BJ, Denney-Wilson E, Byrne R, et al. Screening tools used in primary health care settings to identify health behaviours in children (birth–16 years); A systematic review of their effectiveness, feasibility and acceptability. *Obes Rev* 2024;**25**(4):e13694.
53. Krijger A, ter Borg S, Elstgeest L, van Rossum C, Verkaik-Kloosterman J, Steenbergen E, et al. Lifestyle screening tools for children in the community setting: a systematic review. *Nutrients* 2022;**14**(14):2899.
54. Hennessy M, Byrne M, Laws R, Heary C. "They just need to come down a little bit to your level": a qualitative study of parents' views and experiences of early life interventions to promote healthy growth and associated behaviours. *Int J Environ Res Publ Health* 2020;**17**(10):3605.
55. Rossiter C, Cheng H, Denney-Wilson E. Primary healthcare professionals' role in monitoring infant growth: a scoping review. *J Child Health Care* 2023:13674935231165897.
56. Jeyendra A, Rajadurai J, Chanmugam J, Trieu A, Nair S, Baskaran R, et al. Australian general practitioners' perspectives on their role in well-child health care. *BMC Fam Pract* 2013;**14**:1–7.
57. Australian Government. NHMRC research translation strategy 2022-2025. In: *National health and medical research council*; 2022.
58. Mthethwa RM. *Critical dimensions for policy implementation*. 2012.
59. The Royal Australian College of General Practitioners. Putting prevention into practice: guidelines for the implementation of prevention in the general practice setting. In: *Racgp*. Victoria: Third edition ed. East Melbourne; 2018.
60. Queensland Government. Child health information: your guide to the first 12 months. In: *Childrens health Queensland hospital and health service*; 2022. Queensland.

Appendix A Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.anzjph.2025.100248.

Appendix 4: Systematic Review Reporting Checklist (PRISMA) [148]

Section and Topic	Item #	Checklist item	Thesis section
TITLE			
Title	1	Identify the report as a systematic review.	5.1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	5.2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	5.3
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	5.4
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	5.5.2
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	5.5.1

Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Figure 4
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	5.5.3
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	5.5.4
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	5.5.4
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	5.5.4
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	5.5.4
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	5.5.4

Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	5.5.5
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	5.5.5
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	5.5.5
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	5.5.5
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	5.5.5
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	5.5.5
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	5.5.4
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	N/A
RESULTS			

Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	5.6.1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	5.6.1
Study characteristics	17	Cite each included study and present its characteristics.	5.6.1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	5.6.2
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	5.6.3
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	5.6.4 & 5.6.5 & 5.6.6 & 5.6.7
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	N/A
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	N/A

	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	N/A
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	N/A
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	5.7
	23b	Discuss any limitations of the evidence included in the review.	5.7.1
	23c	Discuss any limitations of the review processes used.	5.7.1
	23d	Discuss implications of the results for practice, policy, and future research	5.7.2
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	5.5
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	5.5

	24c	Describe and explain any amendments to information provided at registration or in the protocol.	N/A
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Appendix 5
Competing interests	26	Declare any competing interests of review authors.	Appendix 5
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Appendix 5

Appendix 5: Published Systematic Review Manuscript in *Obesity Reviews*

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REVIEW

OBESITY Reviews WILEY

Screening tools used in primary health care settings to identify health behaviours in children (birth–16 years); A systematic review of their effectiveness, feasibility and acceptability

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Summary

Background: Child health behaviour screening tools have potential to enhance the effectiveness of health promotion and early intervention. This systematic review aimed to examine the effectiveness, acceptability and feasibility of child health behaviour screening tools used in primary health care settings.

Methods: A systematic review of studies published in English in five databases (CINAHL, Medline, Scopus, PsycINFO and Web of Science) prior to July 2022 was undertaken. Eligible studies described: 1) screening tools for health behaviours (dietary, physical activity, sedentary or sleep-related behaviours) used in primary health care settings in children birth to 16 years; 2) tool effectiveness for identifying child health behaviours and changing practitioner behaviour; 3) tool acceptability or feasibility from child, caregiver or practitioner perspective and/or 4) implementation of the screening tool.

Results: Of the 7145 papers identified, 22 studies describing 14 screening tools were included. Only four screening tools measured all four behaviour domains. Fourteen studies reported changes in practitioner self-reported behaviour, knowledge and practice. Practitioners and caregivers identified numerous benefits and challenges to screening.

Conclusions: Health behaviour screening can be an acceptable and feasible strategy to assess children's health behaviours in primary health care. Further evaluation is needed to determine effectiveness on child health outcomes.

KEYWORDS
children, health behaviour, primary health care, screeners

1 | INTRODUCTION

Poor diet quality, inadequate physical activity and poor sleep habits are key modifiable health behaviours contributing to significant health and economic burden globally. Over one-third (38%) of total chronic disease burden is potentially avoidable because of modifiable risk factors.[1,2] Health behaviours are established during childhood and adolescence and can have a significant influence on health across the life course.[3–5] Therefore, identification of poor health behaviours and intervention in early life is critical to support lifelong health.[6,7]

Primary Health Care (PHC) is defined by the World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF) as being *"a whole-of-society approach to health that aims at ensuring the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment"*.[8] PHC is often the first point of contact to the health care system for families of young children and is therefore an opportunistic and important setting for promotion of, and early intervention for positive health behaviours in childhood and adolescence. PHC is a trusted, valued and accessible setting for children and their families, with key responsibilities in screening for disease risk factors and providing counselling for families.[9–11] Current recommended practice within PHC is to identify children with or at risk of overweight or obesity, as a proxy for poor health behaviours, based on growth monitoring, with or without brief advice for health behaviours.[12–15] However, several international systematic reviews have found a lack of high-level evidence to support the effectiveness of routine growth monitoring as a screening tool in practice, and its benefit on child health.[16–18] Further, practitioners have difficulty plotting and interpreting growth charts to inform practice, resulting in potentially inappropriate or ill-informed advice[19] while caregivers are often not receptive to weight-focussed conversations.[20–22] Growth monitoring also provides little guidance on what health behaviours the child and family might require support with. Given these limitations with current growth monitoring practice, there is opportunity to utilise measures of diet quality, physical activity, sedentary behaviours and sleep habits as modifiable health behaviours that influence child growth and key risk factors for non-communicable disease in later life. Health behaviour screening would allow PHC practitioners to better understand a child's unique health behaviours and provide tailored advice to families.

'Gold standard' methods of measuring health behaviours such as accelerometry and diet histories can be time consuming and are therefore not feasible in time-poor settings such as PHC.[23,24] Brief screening tools can be a time-efficient and cost-effective method of assessing health behaviours, allowing for identification of specific target behaviours to inform individualised counselling and intervention. Incorporation of screening for health behaviours into PHC practice provides greater insight into child health, beyond weight status, compared with current growth monitoring practice. The interrelated nature of health behaviours means it is important to identify and manage behaviours as they exist collectively, rather than in isolation.[25–27] Thus, brief screening tools that comprehensively measure child health behaviours, that is, measure all four health behaviour domains of diet, activity, sedentary and sleep-related behaviours, pose an effective strategy to support long-term population health and a more cost-effective and sustainable PHC system.

A systematic review by Byrne and colleagues identified and described the validity and reliability of 12 brief screening tools to measure health behaviours in children in the first 5 years of life.[28] However, none of the included screening tools measured all four health behaviour domains (dietary intake, physical activity, sedentary behaviour, and sleep), and few were used or evaluated in PHC settings. Thus, their suitability for application in this setting is unknown. Further tools were identified in a recent systematic review by Krijger and colleagues, which described 41 unique screening tools to measure lifestyle behaviours in children aged 0–18 years in community settings.[29] However, the tools described in this review ranged in length, with several tools >25 items in length, impacting their suitability for use in the time poor PHC setting. Additionally, these reviews did not address: post-screening actions (i.e., counselling or referral pathways) essential for enabling positive behaviour change; caregiver or practitioner acceptability and feasibility; or the effectiveness of child health behaviour screening on practitioner behaviour, knowledge or practice in PHC settings, which is required to understand if health behaviour screening is suitable for widespread adoption. A gap also exists in knowledge regarding the implementation strategies, and the tools and resources required to embed health behaviour screening into routine PHC practice.

Thus, the aim of this systematic review was to identify and describe screening tools used in PHC settings that measure health behaviours in children from birth to 16 years, and to determine their effectiveness in identifying child health behaviours and changing practitioner knowledge, attitudes and/or practice. The secondary aims were to understand practitioners', caregivers' and children's views of health behaviour screening tools, and the training and resources required to support implementation of health behaviour screening within practice.

2 | METHODS

This systematic review followed a prospectively prepared protocol (PROSPERO International prospective register of systematic reviews: registration number: CRD42022340339 https://www.crd.york.ac.uk/prospero/) and is reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for systematic reviews.[30]

2.1 | Search strategy and information sources

A comprehensive and systematic search of five electronic databases (CINAHL, Medline, Scopus, PsycINFO, Web of Science) was undertaken in July 2022 to identify screening tools used with children and/or caregivers in the PHC setting for the identification of health

behaviours (i.e., diet, physical activity, sedentary behaviour, and sleep). Search terms were pilot tested, refined and tailored to each database in consultation with an academic librarian. Keywords and subject headings were organised into three categories: (i) population (e.g., infant, toddler, preschool, child, youth, adolescent, paediatric) AND (ii) context (e.g., primary health care, family practice, general practitioner, health professional) AND (iii) concept (e.g., screen/screener/screening, questionnaire, survey checklist, detect, identify, diagnosis, decision support systems, decision making). No publication date limits were applied. The full search strategy used in MEDLINE is presented in Supplementary File 1.

2.2 | Eligibility criteria

2.2.1 | Types of studies

Included studies reported on empirical research, including randomised controlled trials, experimental studies, non-randomised comparison studies, pre-post designs, and qualitative research. Reviews, commentaries and letters to the editors, as well as dissertations and conference abstracts, were excluded.

2.2.2 | Participants

Eligible participants included children aged ≤16 years of age and their caregivers, and PHC practitioners (e.g., practice managers, general practitioners, nurses). Studies that included children over 16 years of age were eligible provided the mean age was ≤16 years of age. This child age range was chosen as a child aged 16 years and older can consent to their own medical treatment.[31] For this review, caregiver is used to describe parents and other primary caregivers.

2.2.3 | Concept

The concept of interest was screening tools (including decision support tools, diagnostic tools) for at least one child health behaviour or caregiving practices relating to diet, physical activity, sedentary behaviour, and sleep, such as rules and routines regarding family meals and screen use. There was no specific exclusion criterion for number of tool items; however, because of the nature of the PHC setting, it was assumed all tools would be brief. Studies could examine the screening implementation approach, metrics of use, participant views including acceptability, attitudes, or effectiveness in identifying child health behaviours or changes in practitioner screening behaviour. Screening tools could be delivered via any mode (e.g., paper or online) and be completed by any of the above participant groups (i.e., children, caregivers, practitioners). Studies were excluded if the screening tool focused solely on physical examination or diagnosis, assessed behavioural outcomes of weight loss interventions or the study used the screening tool to assess study eligibility only.

2.2.4 | Context

Eligible studies were undertaken in any PHC setting internationally, including general practice, maternal and child health services, community health or indigenous health services. Studies where the screening tool was used by specialists or services where children are referred for assessment or treatment of overweight were excluded.

2.3 | Selection process

Study selection was undertaken using the web-based systematic review software Covidence[32] by DD, HC, RB, CR, DZ, KD and AM. Studies were screened in duplicate against the a priori defined inclusion and exclusion criteria in two stages: (1) title and abstract screening and (2) full text screening of remaining articles. Any discrepancies were resolved by discussion. Reference lists of included articles and relevant reviews were also hand-searched to identify any additional relevant studies, which were subsequently checked for eligibility against the inclusion and exclusion.

2.4 | Data extraction and risk of bias assessment

Data extraction was performed by one reviewer (DD) using a standardised review-specific data extraction table that had been piloted with selected studies prior and refinements made to ensure consistency in the extraction process across studies. Following data extraction of the first 10% of included papers by two reviewers (DD and Research Assistant), further amendments were made.

Data extracted included: author, year, study title; study details (study design, duration, setting) (Table 1); population characteristics (number of participants, child age, PHC practitioner role, number of PHC centres) (Table 1); screening tool characteristics (name, number of items, health behaviours addressed, administration method, any reported testing for validity and reliability) (Table 2); changes in practitioner behaviour (Table 3); PHC practitioner views on screening tools (Figure 2A); caregiver views on screening tools (Figure 2B); and practitioner-identified training and resource needs (Table 4). If the eligible screening tool was not available, corresponding authors were contacted via email to seek a copy for data extraction purposes.

Risk of bias assessment was undertaken with the Mixed Methods Appraisal Tool (MMAT)[55] by two reviewers (DD and EH), which assesses study quality on five domains for five empirical study designs: (1) Qualitative, (2) Quantitative randomised controlled trials, (3) Quantitative non-randomised, (4) Quantitative descriptive, and (5) Mixed methods.

2.5 | Data synthesis

A narrative synthesis approach was used in this review because of the range of different study designs (including qualitative and

TABLE 1 Summary of included studies.

Study details	Intervention details	Child + caregiver population	PHC practitioner population	MMAT score
First author (Year) *Country*	*Study design* *Intervention period/Study length*	*Child age*[a] *Child sample size*	*Practitioner sample size* *Number of PHC clinics*	*Out of 100%*
Beno et al. (2005)[33] United States	Intervention with follow up qualitative questionnaire and focus groups 6-months	Child age N/R	Practitioners n = 76 PHC Clinics n = 9	20%
Hinchman et al. (2005)[34] United States	Delayed-control design 6-months	Children 5–18 years Children n = 660	Practitioners n = 101 PHC Clinics n = 9	40%
Dunlop et al. (2007)[35] United States	Medical Record Abstraction 6-months	Children 2–17 years Children n = 1,348	Practitioners n = 38 PHC Clinics n = 6	80%
Woolford et al. (2009)[36] United States	Mixed Methods 12-months	Children 2–5 years	Practitioners n = 15 PHC Clinics N/R	20%
McKee et al. (2010)[37] United States	Qualitative evaluation of pilot intervention Intervention period N/R	Children 22–59 months Caregiver n = 18	PHC Clinics = 3	60%
Watson-Jarvis et al. (2011a)[38] Canada	Descriptive cross-sectional survey 5-months	Child age N/R Caregiver n = 412	Practitioners n = 26 PHC Clinics n = 2	20%
Watson-Jarvis et al. (2011b)[39] Canada	Descriptive cross-sectional survey 5-months	Children 3- ≥ 6 years Caregiver n = 438	PHC Clinics n = 2	60%
Andrade et al. (2020)[40] Canada	Mixed Methods 12-months	Children <17–72 months Children n = 280	Practitioners n = 5 PHC Clinics n = 5	40%
Christison et al. (2014)[41] United States	Prospective, non-randomized, observational study 14-weeks	Children 4–16 years Children n = 100	Practitioners n = 7 PHC Clinics n = 1	20%
Herbenick et al. (2018)[42] United States	Evidence-based practice design 10-weeks	Children 4–11 years Children n = 27	PHC Clinics n = 1	20%
Bailey-Davis et al. (2019)[43] United States	Quasi Experimental 12-months	Children 2–9 years Children n = 10,647	PHC Clinics n = 20	40%
Gance-Cleveland et al. (2014)[44] United States	Study design N/R 8-months	Child age N/R Children n = 3,215	Practitioners n = 14 PHC Clinics n = 12	20%
Park et al. (2015)[45] United Kingdom	Uncontrolled pilot intervention study with questionnaire and semi-structured interviews 6-months	Children 5–18 years Child mean age 10.7 ± 2.6 years Children n = 14 Caregiver n = 12	Practitioners n = 4 PHC Clinics n = 4	20%
Sharpe et al. (2016)[46] United States	Quality improvement study 6-months	Children 3–16 years Children n = 41 Caregiver n = 41	PHC Clinics n = 1	20%
Polacsek et al. (2009)[47] United States	Quasi experimental 18-months	Children 5–18 years 5-11 years = 56% 12–17 years = 44% Children n = 600 Caregiver n = 539	Practitioners n = 31 PHC Clinics n = 19	20%
Gibson et al. (2016)[48] United States	Retrospective and postintervention chart reviews 6-weeks	Preintervention child mean age 13.1 ± 3.8 years Children n = 134	PHC Clinics n = 2	60%
Camp et al. (2017)[49] United States	Mixed Methods 8-weeks	Children 2–9 years Children n = 601	Practitioners n = 12 PHC Clinics n = 2	20%
Camp et al. (2020)[50] United States	Mixed Methods 6-weeks	Children 2–9 years Children n = 425	Practitioners n = 12 PHC Clinics n = 2	20%
Karacabeyli et al. (2020)[51] Canada	Preintervention and postintervention observational mixed methods 9 months (Community A) 12 months (Community B)	Children age N/R	Practitioners n = 21 PHC Clinics n = 6	20%

TABLE 1 (Continued)

Study details	Intervention details	Child + caregiver population	PHC practitioner population	MMAT score
Savage et al. (2018)[52] United States	Protocol for a Randomised Controlled Trial 7-months	Children 0–6 months Sample size aim: n = 290 mother-infant dyads	PHC Clinics N/R	20%
Shook et al. (2018)[53] United States	Cross-sectional review of electronic medical records 3-years	Children 2–18 years Children n = 24,255	PHC Clinics n = 1	80%
Williams et al. (2020)[54] United States	Mixed Methods 10-months	Children 3–17 years	Practitioners n = 44 PHC Clinics n = 2	20%

Abbreviations: MMAT: Mixed Methods Assessment Tool,[55] MMAT scored out of 100%, 20% per question, higher % score indicating higher quality study; N/R: Not reported.
[a]Child age as reported in the study.

mixed methods studies), research questions and outcome measures reported in the included studies. The narrative synthesis of findings was structured to address the primary and secondary aims. Synthesis was organised into five key components: 1) description of available screening tools; 2) effectiveness of screening tools for identifying child health behaviours and changing PHC practitioner knowledge, attitudes, and practice; 3) acceptability and feasibility of tools for a) PHC practitioners and b) caregivers and children; 4) training and resources required for implementation of screening tools.

3 | RESULTS

3.1 | Search results and characteristics of included studies

Database searching identified 7145 unique records of which 19 met the review criteria (Figure 1). An additional three eligible studies were identified through citation pearling. The final 22 studies included in this review were undertaken in the United States (US) (n = 17), Canada (n = 4) and the United Kingdom (UK) (n = 1) (Table 1). Studies were predominately non-controlled interventions or quality improvement projects,[33,34,43,45–51] ranging in duration from 6 weeks[48,50] to 3 years.[53] The number of PHC clinics included in a given study varied from one[41,42,46,53] to 20 clinics.[43] PHC practitioners included nurses, dietitians, physicians, and paediatricians, as well as clinic staff, such as clerks and managers. Children included in the studies ranged in age from 0–6 months[52] up to 18 years (e.g., 2–18 years), with only three studies including children aged <24 months[37,40,52] and most studies including children >2 years of age (n = 17). Overall, MMAT scores were mixed, with 14 studies reporting low risk of bias in one of five domains, receiving a score of 20%. Only two studies[35,53] reported low risk of bias in four of five domains (score of 80%). None received a score of 100% (low risk of bias in all five domains) (Table 1 and Supplementary Table S1).

3.2 | Characteristics of screening tools

Fourteen unique screening tools were identified across the 22 studies (Table 2). Four screening tools were not available in publication data — corresponding authors were contacted, of whom two responded to provide two screening tools as part of data extraction and synthesis: 5-2-1-0 Healthy Habits Survey[47] and The Family Lifestyle Assessment of Initial Risk (FLAIR).[37] Tools ranged in length from 5[53] to 22 items[33–36,46] and were completed by patients (caregiver, or caregiver and child), practitioners, or both, using various administration methods (paper, online or computer, electronic medical record-based), timing (during or, prior to, consultation), and locations (home, waiting room, appointment room). Four tools addressed all four health behaviours of diet, physical activity, sedentary behaviour and sleep: Computer-Assisted Treatment of CHildhood overweight (CATCH)[45]; Early Healthy Lifestyles (EHL)[52]; Healthy Habits Questionnaire (HHQ)[48–50]; Live 5–2–1-0 HHQ.[51] Most tools (n = 9) addressed the three health behaviour domains of diet, physical activity, and sedentary behaviour. One tool[38–40] addressed only two health behaviour domains, diet, and sedentary behaviour. In addition to the health behaviours of interest in this review, four tools addressed anthropometry (height, weight, BMI, or BMI category) and nine measured caregiving practices or their perspectives related to their child's health behaviours. The Family Nutrition and Physical Activity (FNPA) risk assessment tool and the Nutrition Screening Tool for Every Preschooler (NutriSTEP) questionnaire have been tested for both validity and reliability[56–58] and the Starting the Conversation 4-12 tool (STC 4-12) has been tested only for reliability.[59]

3.3 | Effectiveness in identifying child health behaviours and changing practitioner behaviour, knowledge or practice

No studies reported on effectiveness of screening related to identifying child health behaviours. Fourteen studies,[34–36,40,41,43–45,47–51,54] described changes to practitioner behaviours, knowledge and/or

TABLE 2 Characteristics of health behaviour screening tools identified for children in primary health care settings.

Tool name	Tool features		Tool questions/content					
Tool name (reference studies)	No of items	Scale used Scoring system	Diet	PA	SB	Sleep	Anthro	Caregiver Practices/ Perspectives
Assessment and Targeted Messages (ATM) tool Woolford (2009)[36]	22	Yes/No questions 10-point Likert scale (not ready to very ready)	✓	✓	✓		✓ BMI category	✓
Computer-Assisted Treatment of Childhood Overweight (CATCH) Park et al. (2015)[45]	16	Yes/No questions Frequency	✓	✓	✓	✓	✓	✓
Early Healthy Lifestyles (EHL) risk assessment tool[a] Savage et al. (2018)[52]	N/R	N/R	✓	✓	✓	✓		✓
Lifestyle Assessment Questionnaire Shook et al. (2018)[53]	5	Likert scale 5–10 response options (vary per question)	✓	✓	✓			
Family Nutrition and Physical Activity (FNPA) risk assessment tool Christison et al. (2014)[41] Herbenick et al. (2018)[42] Bailey-Davis et al. (2019)[43]	20	4-point Likert scale (almost never - almost always)	✓	✓		✓		✓
HeartSmart Kids (HSK)[a] Gance-Cleveland et al. (2014)[44]	N/R	N/R	✓	✓	✓		✓ Height, Weight + BMI	
5–2–1-0 Healthy Habits Survey 2 versions: 2–9 years and 10 and older Polacsek et al. (2009)[47]	10	Yes/No questions Continuous numeric values Identification of a priority behaviour the caregiver desires to change	✓	✓	✓			
Healthy Habits Questionnaire Gibson et al. (2016)[48] Camp et al. (2017)[49] Camp et al. (2020)[50]	10	Yes/No questions Continuous numeric values Identification of a priority behaviour the caregiver desires to change	✓	✓	✓	✓		✓
Live 5210 Healthy Habits Questionnaire Karacabeyli et al. (2020)[51]	20	Yes/No questions 3–4-point Likert scale questions Identification of a priority behaviour the caregiver desires to change	✓	✓	✓	✓		✓
Nutrition and Activity Self History (NASH) Form Beno et al. (2005)[33] Hinchman et al. (2005)[34] Dunlop et al. (2007)[35]	22	Continuous numeric values 3–4-point Likert scale	✓	✓	✓			
Nutrition Screening Tool for Every Preschooler (NutriSTEP) Questionnaire Watson-Jarvis et al. (2011a)[38] Watson-Jarvis et al. (2011b)[39]	17	4-point Likert scale Total score 0 to 68 Score classification Low risk (<20)	✓		✓			✓

TABLE 2 (Continued)

Tool name	Tool features		Tool questions/content					
Tool name (reference studies)	No of items	Scale used Scoring system	Diet	PA	SB	Sleep	Anthro	Caregiver Practices/ Perspectives
Andrade et al. (2020)[40]		Moderate risk (21–25) High risk (>26)						
Starting the Conversation 4–12 tool (STC 4–12) Sharpe et al. (2016)[46]	22	3- or 4-point Likert scale (vary per question) Low risk = 20 Highest risk = 60	✓	✓	✓			✓
The Family Lifestyle Assessment of Initial Risk (FLAIR) McKee et al. (2010)[37]	19	Yes/No questions 3-point Likert scale Continuous numeric values	✓	✓	✓		✓ Height + Weight	✓
12,345-FitTastic Williams et al. (2020)[54]	6	6–11 response options per question	✓	✓	✓			

Abbreviations: N/R: Not reported; PA: Physical Activity; SB: Sedentary Behaviour; BMI: Body Mass Index; Anthro: Anthropometry.

[a]Tools not available for extraction.

[b]As reported in the primary study.

TABLE 2 (Continued)

Tool name	Administration methods				Tested for[b]	
Tool name (reference studies)	Mode	Timing	Location	Completed by	Validity	Reliability
Assessment and Targeted Messages (ATM) tool Woolford (2009)[36]	N/R	During	Appointment room	Caregiver + Practitioner	N/R	N/R
Computer-Assisted Treatment of Childhood Overweight (CATCH) Park et al. (2015)[45]	Online	During	Appointment room	Caregiver + Practitioner	N/R	N/R
Early Healthy Lifestyles (EHL) risk assessment tool[a] Savage et al. (2018)[52]	Online *(integrated into electronic medical record)*	Prior	Waiting room	Caregiver	N/R	N/R
Lifestyle Assessment Questionnaire Shook et al. (2018)[53]	Online	Prior	Waiting room	Caregiver	N/R	N/R
Family Nutrition and Physical Activity (FNPA) risk assessment tool Christison et al. (2014)[41] Herbenick et al. (2018)[42] Bailey-Davis et al. (2019)[43]	N/R N/R Online	During Prior Prior	N/R N/R Waiting room (85%) Home (15%)	Caregiver OR Child Caregiver Caregiver	✓[36,57]	✓[36]
HeartSmart Kids (HSK)[a]	Online	N/R	N/R	Caregiver + Child	N/R	N/R

TABLE 2 (Continued)

Tool name	Administration methods				Tested for[b]	
Tool name (reference studies)	Mode	Timing	Location	Completed by	Validity	Reliability
Gance-Cleveland et al. (2014)[44]						
5–2–1-0 Healthy Habits Survey 2 versions: 2–9 years and 10 and older Polacsek et al. (2009)[47]	Paper	Prior	Waiting room	Caregiver OR child	N/R	N/R
Healthy Habits Questionnaire Gibson et al. (2016)[48] Camp et al. (2017)[49] Camp et al. (2020)[50]	N/R Paper Paper *(then entered into electronic medical record)*	Prior Prior Prior	Waiting Room Waiting Room Waiting Room	Caregiver (2-9yo) OR Child (10-18yo) Caregiver Caregiver	N/R	N/R
Live 5210 Healthy Habits Questionnaire Karacabeyli et al. (2020)[51]	N/R	Prior	Waiting Room	Caregiver (2-9yo) OR Child (10-18yo)	N/R	N/R
Nutrition and Activity Self History (NASH) Form Beno et al. (2005)[33] Hinchman et al. (2005)[34] Dunlop et al. (2007)[35]	Paper N/R Paper	Prior Prior Prior	Waiting Room N/R Waiting Room	Caregiver or Child Child Caregiver	N/R	N/R
Nutrition Screening Tool for Every Preschooler (NutriSTEP) Questionnaire Watson-Jarvis et al. (2011a)[38] Watson-Jarvis et al. (2011b)[39] Andrade et al. (2020)[40]	N/R Paper Paper 2/5 clinics Computer 2/5 clinics N/R 1/5 clinic	During Prior 1/2 clinic After 1/2 clinic Prior 2/5 clinics During 3/5 clinics	Waiting Room Waiting Room Waiting Room 2/5 clinics Appointment Room 3/5 clinics	Caregiver Caregiver Caregiver 2/5 clinics Caregiver + Practitioner 2/5 clinics N/R 1 clinic	✓[58]	✓[58]
Starting the Conversation 4–12 tool (STC 4–12) Sharpe et al. (2016)[46]	N/R	Prior	N/R	Caregiver	N/R	✓[59]
The Family Lifestyle Assessment of Initial Risk (FLAIR) McKee et al. (2010)[37]	Paper	Prior	N/R	Caregiver	N/R	N/R
12345-FitTastic Williams et al. (2020)[54]	Electronic Medical Record	During	N/R	Practitioner	N/R	N/R

Abbreviations: N/R: Not reported; PA: Physical Activity; SB: Sedentary Behaviour; BMI: Body Mass Index; Anthro: Anthropometry.
[a]Tools not available for extraction.
[b]As reported in the primary study.

TABLE 3 Changes in practitioner behaviour, knowledge and practice in health behaviour screening.

	Findings
Screening rates	• **Use of the tool increased** from 0% (pre-intervention to 82% (during intervention) ($p < 0.001$)[47] • **Use of screening tool increased** from 0% to 88% (tool not used before project)[48] • 64% of providers reported that tool **increased their rates of obesity screening and education**, 18% of providers reported screening had no impact[54] • **Tool used in 92.2% of visits**[50] • **Training had a positive impact on the use of the tool**, sustained at 3- and 6-month follow up[34] • 92% (n = 258) of records had **valid screen completions**[40] • **45% of caregivers completed assessment in appointment**[43]
Health behaviour discussion/counselling/promotion	• Caregiver survey indicated **increased health behaviour discussions**[47]: ◦ Nutrition (74% pre vs 92% during; $p < 0.0002$) ◦ Physical activity (78% pre vs 88% during; $p = 0.02$) ◦ Screen time (58% pre vs 79% during; $p < 0.005$) ◦ Sugar-sweetened drinks (54% pre vs 82% during; $p < 0.0004$) • Improved **correct weight categorisation** (52.2% pre intervention vs 68.1% post intervention)[49] • Increase in **routine annual BMI tracking** for all paediatric patients (7% pre vs 29% post)[51] • Increased practitioner **routine promotion of healthy behaviours** including[51]: ◦ nutrition (43% pre vs 79% post) ◦ physical activity (50% pre vs 79% post) ◦ screen time (14% pre vs 64% post) ◦ sugar sweetened beverage consumption (29% pre vs 71% post)
Documentation	• **Significant increases in tool documentation** following dissemination of intervention tools (BMI growth charts, NASH forms, counselling guides and prescription pads) compared with baseline (80.2% vs 49.8% $p < 0.001$)[35] • 87% of patient interviews converted to printed summaries[44] • Improved health behaviour **assessment and counselling documentation**[49] • Medical records with tool completion **provided more detailed and consistent nutrition and exercise documentation**, regardless of weight status[49] • **Provider entry of tool** into electronic medical record **occurred in 82.9%** of visits[50]
Practitioner knowledge and self-efficacy	• Improved practitioner perceived **self-efficacy** in discussing patient readiness for change[41] • Following intervention, practitioners felt they were **more aware of long-term complications related to lifestyle** (71%), **patients were more willing to set behavioural goals** (64), and patients were **more able to self-manage issues related to lifestyle** (50%)[51] • Increased practitioner perceived **self-efficacy** in addressing weight (43% pre vs 93% post) and health behaviours[51] • Increased practitioner **self-reported knowledge** of medical evaluation of paediatric patients with obesity (14% pre vs 36% post), behavioural goal setting (36% pre vs 93% post) and motivational interviewing (57% pre vs 79% post)[51] • Increased practitioner **self-efficacy** in addressing nutrition, physical activity, screen time, sugar-sweetened beverages and behavioural goal setting[47]
Intention to use in future	• Practitioners indicated they were somewhat (62%) and very likely (23%) to **regularly use tool in future**[36] • Low satisfaction (mean <3.5 out of 5 and median <4 out of 5) with … …," would **continue to use** tool"[41] • All practitioners (n = 4) agreed that the tool would be something they would **continue to use** in the future and would like to see **integrated into their clinical software system**[45] • **90% of providers would continue using tool**, including 69% who would continue without patient incentives[54] • Voluntary nature of screening = not administering screen[40]

practice in screening for child health behaviours (Table 3). Seven studies reported increased tool use and/or rates of screening,[34,40,43,47,48,50,54] three studies reported increased health-behaviour discussions/counselling,[47,49,51] and four studies reported improvements in health behaviour documentation.[35,44,49,50] Further, three studies reported improved practitioner self-efficacy in addressing weight and health behaviours,[51] and addressing health behaviour goal setting.[47] Of the four studies that measured practitioner intention to use the tool in future, three reported moderate-high intention.[36,45,54] Whether these outcomes were a direct result of the intervention is unclear. Practitioner behaviour, knowledge and practice may have changed as a result of the resources and training that were provided prior to or during the screening intervention.

3.3.1 | Practitioner views on acceptability and feasibility of screening

Fourteen studies[33,34,36,38–41,44,45,47,49–51,54] described practitioner views on acceptability and/or feasibility of screening (Figure 2A; Supplementary Table 2). Common views positively impacting practitioner acceptability related to the value of screening[33,36,38–41,45,47,49,51] and features of the tool[36,41,44,51,54] (Figure 2A). Screening was commonly valued as being: useful or helpful in assessing health behaviours and facilitating health behaviour conversations with families; important; beneficial to families; and enhancing clinical sessions.[38–40,45] Assorted screening tool features contributed to acceptability of screening, particularly simplicity and clarity.[36,41,44,51,54] Practitioners' perceptions of

TABLE 4 Practitioner-identified training and resources needs alongside health behaviour screening tool.

Training	Training to providers about the tool[35,40] Skill building training[33] Training to providers about how to prioritise and assess most significant behaviours[44] Affordable and practical in-service training[34] Training and technical assistance[40]
Practitioner Resources	More tangible support such as a structured program of activities + follow up consultations to monitor patients[45] Behaviour change list + Examples of exercise + healthy meal options for children[36] Key primer booklet[40] Access to ready-to-use resources alongside the screening tool[51] Decision support chart as part of resource toolkit[48]
Electronic Medical Records	Integration of tool into electronic medical records, automatic calculation of assessment[41,45] Integration of reminders into EMRs[40]
Dietitian support	Onsite nutritionist/dietitian available for drop-in follow-up visits[38] Registered dietitian roles[40]
Administrative support	Administrative staff roles[40] Practitioners depended on administrative staff to administer the screening tool and implementation sustainability was contingent on capacity of front-end administrative staff[51]
Patient education Resources	Educational resources[40]

feasibility were enhanced by the logistics of implementing screening, such as ease of use[33,45] and distribution[34]; ease to incorporate with clinic visits[38,40]; and minimal impact on consultation time.[40,45,49,54]

Conversely, negative practitioner perceptions on acceptability and feasibility related to the time required for screening, either undertaking screening or documenting outcomes in medical records.[33,36,38,40,41,49,50] Other factors limiting acceptability and feasibility related to caregiver difficulties completing screening or the wording of questions within the tools,[36,44,49,50] disruption to workflow,[41] resourcing of IT infrastructure,[44] staffing capacity, skills and confidence,[41,44,45,49,50] or suitability of clinic type (i.e., not immunisation clinic).[38]

3.4 | Caregiver views and acceptability on health behaviour screening tools

Eight studies[37–41,45,46,48] reported the views and acceptability of caregivers on health behaviour screening (Figure 2B, Supplementary Table 3). Caregivers were receptive to incorporating screening into the PHC setting[37] valuing the opportunity to discuss health behaviours with their practitioner.[40,41] Caregivers described being treated with care and feeling comfortable during consults with their practitioner,[41,45] although some caregivers in one study reported a fear of being judged or appearing neglectful.[37] Caregivers across several studies were satisfied with the screening tool used and the resulting consultation.[39,41,45] Tools that were easy to use and took little time to read and complete were acceptable to caregivers.[37,39,41] Discussion of risk identification, goal setting and advice provided by practitioners following screening was well received, found to be useful and informative for caregivers.[37,39,41,45,48] Child acceptability was only discussed in one study: most caregivers and practitioners reported children were comfortable with the consultation, while some children experienced feelings of anxiety or demonstrated indifference.[45]

3.5 | Training and resources needs

Eleven studies described practitioner-identified needs to support screening implementation[33–36,38,40,41,44,45,48,51] (Table 4). These included: affordable provider/practitioner training and technical assistance,[33–35,40,44] practitioner resources to use alongside the screening tool such as referral pathways or behaviour change examples,[36,40,45,48,51] the integration of the screening tool into Electronic Medical Records,[41,45] including reminders,[40] Dietitian support and/or follow up,[38,40] patient (caregiver/child) educational resources,[40] and administrative support/capacity for implementation sustainability.[40,51]

4 | DISCUSSION

This systematic review identified and comprehensively described 14 unique child health behaviour screening tools used in PHC settings located across the United States, United Kingdom, and Canada. Screening tools measured health behaviours across the four domains of diet, physical activity, sedentary behaviour, and sleep, as well as related caregiving practices; however, only four screening tools included items across all four health behaviour domains. Screening tools were effective in changing practitioner self-reported behaviour, knowledge, self-efficacy in screening for child health behaviours, and in the provision of health behaviour education. To our surprise, no studies reported on effectiveness of screening related to identifying child health behaviours. The majority of included studies described practitioner or caregiver views on screening, indicating an overall high

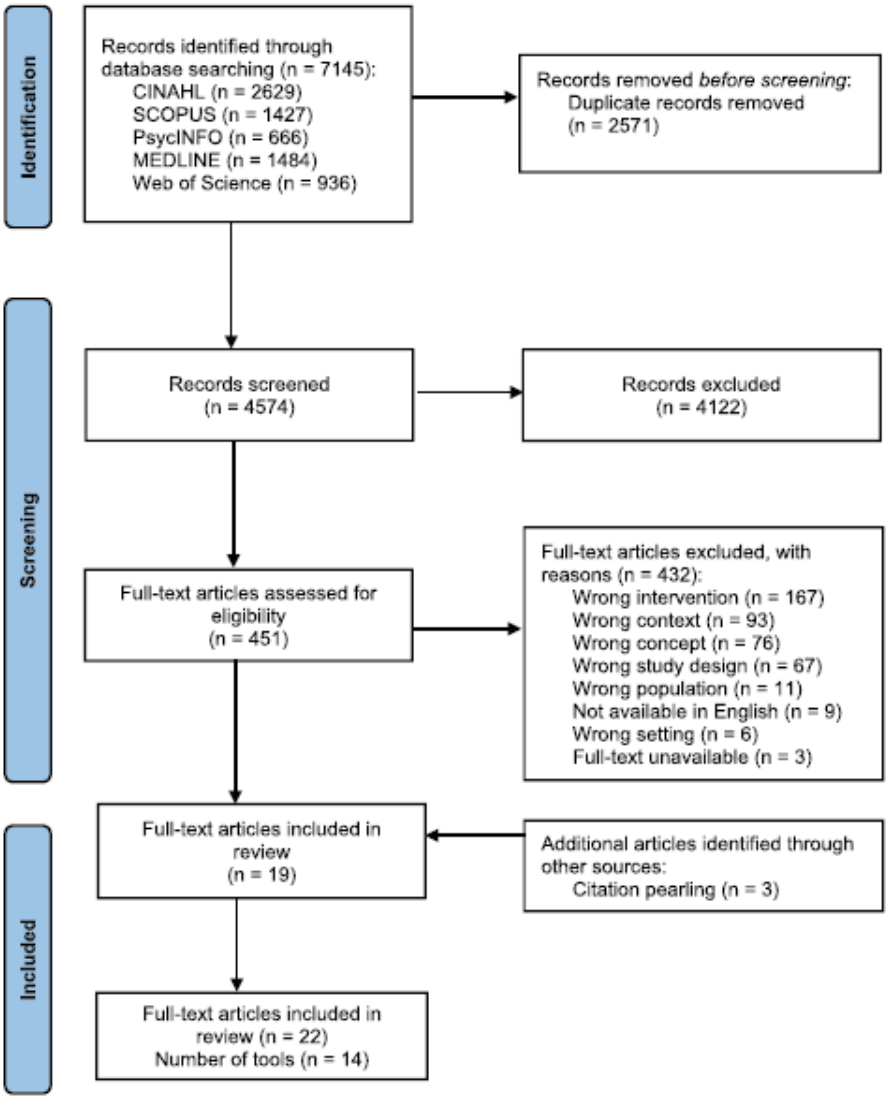

FIGURE 1 PRISMA statement flow diagram.

acceptability of health behaviour screening and feasibility within PHC. Training, resources, and integration into existing systems were identified as essential for implementation and screening success. This demonstrates health behaviour screening to be acceptable, feasible and suitable for implementation in PHC, however the effectiveness on identifying child health behaviours and impact on child health outcomes is unknown.

Overall, this review identified a lack of brief, validated and reliable screening tools for use in the PHC setting that comprehensively measure all four child health behaviour domains. Only four screening tools identified measured all four domains of diet, physical activity, sedentary behaviour, and sleep, and none were tested for validity or reliability. This highlights a need for high-quality, rigorously developed, and validated screening tools that measure all four behaviour domains to enable health practitioner and caregiver conversations that can positively impact child health behaviours. Similar to previous reviews examining health behaviour measurement tools,[28,29] few tools focused on child sleep, indicating that sleep behaviours remain a comparatively novel area for early screening and intervention compared with diet and activity behaviours. This review demonstrated the effectiveness of screening tools in changing practitioner knowledge, attitudes, and practice; but given that all studies used practitioner

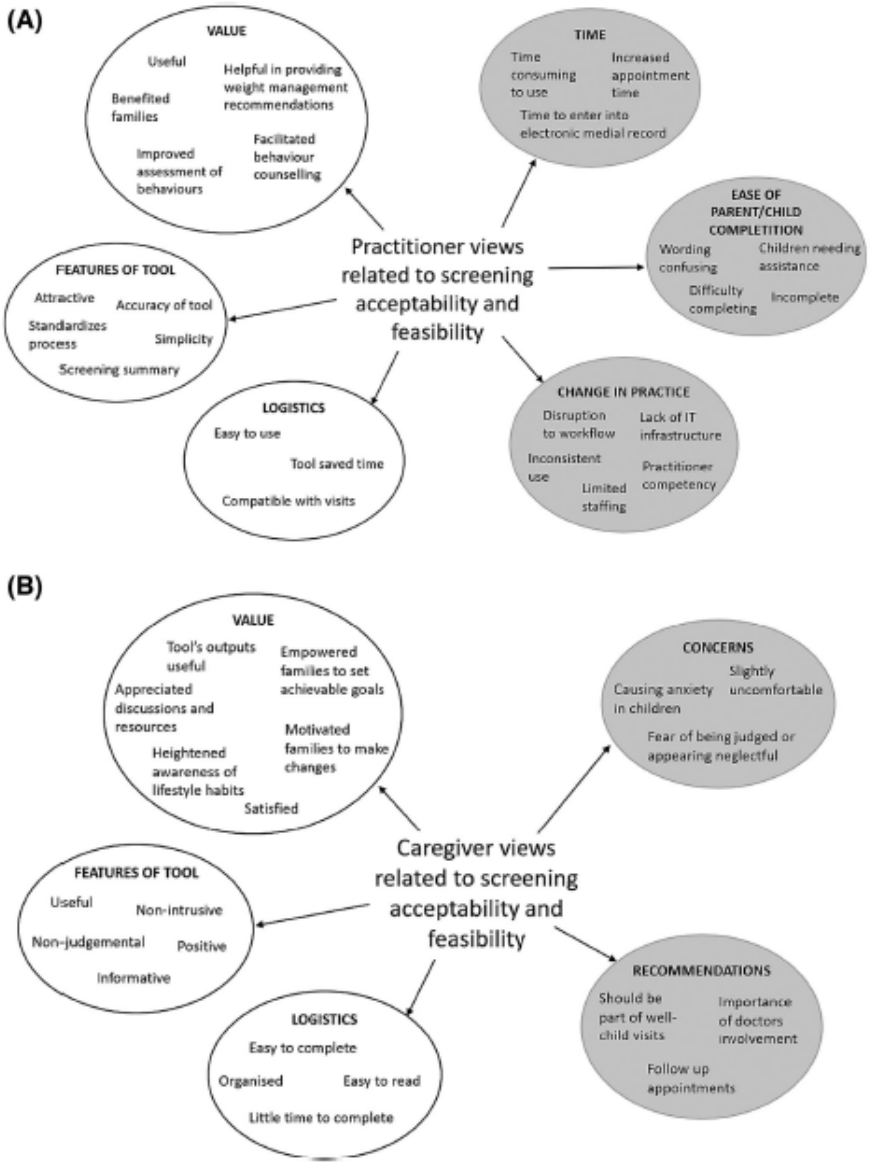

FIGURE 2 (A) Practitioner views related to health behaviour screening acceptability and feasibility (n = 14 studies). White shading indicates favourable practitioner views, grey shading indicates less favourable practitioner views. (B) Caregiver views related to health behaviour screening acceptability and feasibility (n = 8 studies). White shading indicates favourable caregiver views, grey shading indicates less favourable caregiver views.

self-report measures, more robust evaluation of effectiveness are necessary to corroborate these findings.

Of the included studies, three-quarters reported on practitioner or caregiver acceptability and feasibility of screening, with most reporting positive indicators of acceptability and feasibility, such as finding screening tools valuable, easy to use and compatible with visits. Practitioners also indicated negative indicators of acceptability including time burden, limited staffing capacity, and incomplete and inconsistent completion of tools. Nonetheless, the depth of evaluation is limited. Heterogeneity in the evaluation designs, populations, data collection measures, reporting depth, and mixed findings of included studies, restricts our ability to draw firm conclusions on the

acceptability and feasibility of screening from the current body of literature. For successful and sustained implementation of health behaviour screening in PHC settings, acceptability needs to be carefully evaluated from multiple perspectives including practitioners, support staff, practice managers, caregivers, and children. Some studies included practice managers perspectives, and one study included caregiver-reported child perspectives, highlighting clear gaps. While screening was reported by practitioners and caregivers as valuable, feasibility may require further exploration as there were inconsistencies in practitioner views on the logistics of screening being easy to use versus time consuming to perform. Time burden is a particularly important consideration in PHC settings, because of existing time pressures and demand for existing priorities and responsibilities of PHC practitioners, including the treatment and management of disease and injury. As behaviour screening is proposed as a complementary practice to growth monitoring, time to conduct screening and undertake behaviour-directed conversations with caregivers needs to be appropriately resourced and funded. Given that studies often reported single aspects of acceptability or feasibility, or perspectives from only certain viewpoints, there is a need for future comprehensive assessment and co-design with key end-users to inform an acceptable and cost-effective implementation approach in PHC.

Challenges to implementing a change in routine practice include a lack of funding, resources, time and the need for administrative and managerial support.[60] Our review found a need to support PHC practices in these challenges, through providing adequate practitioner training and resources, integration into electronic medical records, administrative and dietitian support and patient education resources. Practitioners require adequate training to learn a new practice and feel confident and supported to implement the practice as part of their routine care. Literature suggests that it takes 17–20 years for the adoption of new interventions into routine practice.[61] This demonstrates that implementing a change in practice requires more than just screening tool dissemination, but a proactive and substantive collaboration with key stakeholders and the provision of adequate training and resources.[62,63] This is supported by the findings of our review, which describes many practitioner-identified challenges to implementing a new practice of health behaviour screening. Practitioners identified training needs to support implementation and intervention success and highlighted the importance of integration of a screening tool into electronic medical records, staff roles and capacity and practitioner resources such as decision support charts, examples of specific behaviour change strategies and follow up consultations. This aligns with the findings of Krijger and colleagues[29] who identified the importance and need for specific actions following screening that extend beyond counselling to address target behaviours, such as repeating screening after a certain time and referral to multidisciplinary team members. Qualitative literature also suggests engagement, open discussions and buy-in from PHC practitioners as vital to support adoption of new practices in PHC settings.[64] Successful implementation of health behaviour screening is achievable, but requires unique and adaptable end-user informed implementation strategies, tailored to the context and needs of the clinic, to support successful integration into PHC.

Key themes of Australian national public health policy include prioritising preventive health through screening and early intervention, indicating policy alignment for health behaviour screening as a potential early intervention and health promotion strategy.[65,66] This review highlights several important avenues for future research that will be required to work towards policy directives regarding the implementation of screening and early intervention in PHC settings. While this review has identified several health behaviour screening tools that have been used in PHC, there is a lack of evidence regarding the validity and reliability of tools that assess all relevant health behaviour domains (i.e., nutrition, physical activity, sedentary behaviour and sleep). Prior to the implementation of health behaviour screening tools in PHC, the validity and reliability should be investigated to ensure the utility of these tools as screening instruments. Tt.[67] The design of future research and screening tool development should be informed by a variety of end-users, including health practitioners, other PHC staff, caregivers, and children, and should incorporate rigorous testing for tool validity and reliability to understand the measurement quality. Collaborative engagement with these end users would provide valuable insight into feasible, acceptable and context specific approaches to the implementation of health behaviour screening in PHC settings, as well as the support required to embed screening in routine care.[68,69]

The results of this review should be considered in the context of strengths and limitations. The strengths include: (1) the review protocol being prospectively registered on PROSPERO with methodology according to PRISMA guidelines,[30] (2) the use of a comprehensive search strategy developed in collaboration with academic librarians across five databases, (3) contacting corresponding authors to retrieve screening tools not included in publications to enable complete assessment of screening tools. The primary limitation of this review is the exclusion of articles not published in English, grey literature, and unpublished theses, which may have limited inclusion of additional relevant literature or capturing of additional screening tools. Included studies also only came from the US, UK and Canada, limiting the generalisability to PHC settings in other countries. The quality of included articles should also be recognised with most (17 of 22) included studies scoring 40% or lower using the MMAT critical appraisal tool, with Mixed Methods and Non-randomised studies being the most poorly reported. This highlights a lack of high-quality evidence within the limited body of literature regarding health behaviour screening in PHC. Data relating to tool validity and reliability in this review are described as reported by the primary study. The quality of this evidence was not reviewed. Further evaluation of the quality of studies reporting tool measurement properties should be evaluated using COSMIN guidelines.

5 | CONCLUSION

Few screening tools exist to facilitate comprehensive screening of children's health behaviours in PHC. Practitioners reported increased knowledge, self-efficacy, confidence and increased rates of documentation and health behaviour counselling, in addition to the barriers,

enablers, training, and resource needs alongside screening tools. These findings provide new knowledge about the existence, implementation, acceptability, and feasibility of health behaviour screening tools, with mostly positive views. However, the body of literature also demonstrates a need for more comprehensive evaluation of the effectiveness on child health outcomes, psychometric properties of tools and end-user informed implementation strategies to enable integration into PHC. This review highlights the potential of health behaviour screening as an acceptable and feasible strategy to comprehensively assess and provide early intervention for children's health behaviours in PHC settings.

AUTHORS CONTRIBUTIONS

Rebecca K. Golley, Dorota Zarnowiecki, Kamila Davidson, Elizabeth Denney-Wilson, Brittany J. Johnson and Lucinda Bell conceived the project and provided study oversight. With the assistance of a research librarian, Dorota Zarnowiecki developed the search strategy and Dimity Dutch conducted the search. Dimity Dutch, Heilok Cheng, Rebecca Byrne, Chris Rossiter, Dorota Zarnowiecki, Kamila Davidson and Alexandra Manson carried out article screening, Dimity Dutch conducted data extraction, and Dimity Dutch and Eve House completed critical appraisal. Dimity Dutch, Heilok Cheng, Eve House, Brittany J. Johnson, Lucinda Bell and Alexandra Manson drafted the manuscript and all authors contributed to the interpretation of the results and critical review of the manuscript. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

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REFERENCES

1. Australian Institute of Health and Welfare. Australian Burden of Disease Study. 2018: Interactive data on risk factor burden. 2021. [Available from: https://www.aihw.gov.au/reports/burden-of-disease/abds-2018-interactive-data-risk-factors/contents/summary
2. Australian Institute of Health and Welfare. Chronic conditions and multimorbidity. 2022 [Available from: https://www.aihw.gov.au/reports/australias-health/chronic-conditions-and-multimorbidity
3. Birch LL, Fisher JO. Development of eating behaviors among children and adolescents. *Pediatrics*. 1998;101(3 Pt 2):539-549.
4. Craigie AM, Lake AA, Kelly SA, Adamson AJ, Mathers JC. Tracking of obesity-related behaviours from childhood to adulthood: a systematic review. *Maturitas*. 2011;70(3):266-284.
5. Wang Y, Bentley ME, Zhai F, Popkin BM. Tracking of dietary intake patterns of Chinese from childhood to adolescence over a six-year follow-up period. *J Nutr*. 2002;132(3):430-438.
6. 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. *Obes Rev*. 2007;8(4):327-338.
7. Terry MB, Forman MR. Empowering pediatricians to prevent chronic disease across generations. *Pediatrics*. 2016;138(Supplement_1):S92-S94.
8. World Health Organisation and the United Nations Children's Fun (UNICEF). *A vision for primary health care in the 21st century: towards universal health coverage and the sustainable development goals*. WHO/HIS/SDS/2018.X; 2018.
9. Australian Institute of Health and Welfare. Primary health care in Australia: AIHW. 2016. [Available from: https://www.aihw.gov.au/reports/primary-health-care/primary-health-care-in-australia/contents/about-primary-health-care
10. Dugani S, Veillard J, Evans TG. Quality primary health care will drive the realization of universal health coverage. *Cmaj*. 2018;190(15):E453-e4.
11. Mayne SL, Hannan C, Faerber J, et al. Parent and primary care provider priorities for wellness in early childhood: a discrete choice experiment. *J Child Fam Stud*. 2021;30(9):2238-2249.
12. Cheng H, Eames-Brown R, Tutt A, et al. Promoting healthy weight for all young children: a mixed methods study of child and family health nurses' perceptions of barriers and how to overcome them. *BMC Nurs*. 2020;19(1):84.
13. Robinson A, Denney-Wilson E, Laws R, Harris M. Child obesity prevention in primary health care: investigating practice nurse roles, attitudes and current practices. *J Paediatr Child Health*. 2013;49(4):E294-E299.
14. The Royal Australian College of General Practitioners. *Guidelines for preventive activities in general practice*. 9th ed. RACGP; 2016.
15. World Health Organisation. *Guideline: assessing and managing children at primary health-care facilities to prevent overweight and obesity in the context of the double burden of malnutrition. Updates for the Integrated Management of Childhood Illness (IMCI)*. WHO; 2017.

16. Ashworth A, Shrimpton R, Jamil K. Growth monitoring and promotion: review of evidence of impact. *Matern Child Nutr*. 2008;4 Suppl 1 (Suppl 1):86-117.
17. Garner P, Panpanich R, Logan S. Is routine growth monitoring effective? A systematic review of trials. *Arch Dis Child*. 2000;82(3): 197-201.
18. Sim LA, Lebow J, Wang Z, Koball A, Murad MH. Brief primary care obesity interventions: a meta-analysis. *Pediatrics*. 2016;138(4): e20160149. doi:10.1542/peds.2016-0149. Epub 2016 Sep 12. PMID: 27621413.
19. de Onis M, Wijnhoven TM, Onyango AW. Worldwide practices in child growth monitoring. *J Pediatr*. 2004;144(4):461-465.
20. Denney-Wilson E, Cheng H, Eames-Brown R. *Exploring the infant feeding advice provided by child family health nurses in SLHD and SWSLHD: final report*. University of Sydney; 2018.
21. Mansoor Y, Hale L. Parent perceptions of routine growth monitoring: a scoping review. *Paediatr Child Health*. 2021;26(3):154-158.
22. Turer CB, Upperman C, Merchant Z, Montaño S, Flores G. Primary-care weight-management strategies: parental priorities and preferences. *Acad Pediatr*. 2016;16(3):260-266.
23. Lee IM, Shiroma EJ. Using accelerometers to measure physical activity in large-scale epidemiological studies: issues and challenges. *Br J Sports Med*. 2014;48(3):197-201.
24. Magarey A, Watson J, Golley RK, et al. Assessing dietary intake in children and adolescents: considerations and recommendations for obesity research. *Int J Pediatr Obes*. 2011;6(1):2-11.
25. Syme SL. The prevention of disease and promotion of health: the need for a new approach. *Eur J Public Health*. 2007;17(4): 329-330.
26. Leech RM, McNaughton SA, Timperio A. The clustering of diet, physical activity and sedentary behavior in children and adolescents: a review. *Int J Behav Nutr Phys Act*. 2014;11(1):4.
27. Watanabe E, Lee JS, Mori K, Kawakubo K. Clustering patterns of obesity-related multiple lifestyle behaviours and their associations with overweight and family environments: a cross-sectional study in Japanese preschool children. *BMJ Open*. 2016;6(11):e012773.
28. Byrne R, Bell L, Taylor RW, et al. Brief tools to measure obesity-related behaviours in children under 5 years of age: a systematic review. *Obes Rev*. 2019;20(3):432-447.
29. Krijger A, Ter Borg S, Elstgeest L, et al. Lifestyle screening tools for children in the community setting: a systematic review. *Nutrients*. 2022;14(14):2899. doi:10.3390/nu14142899. PMID: 35889854; PMCID: PMC9325265.
30. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:n71.
31. Australia GoS. Consent to Medical Treatment and Palliative Care Act 1995. 2023. [Available from: https://www.legislation.sa.gov.au/lz?path=%2FC%2FA%2FCONSENT%20TO%20MEDICAL%20TREATMENT%20AND%20PALLIATIVE%20CARE%20ACT%201995
32. Innovation VH. Covidence systematic review software Melbourne, Australia. 2022. [Available from: https://www.covidence.org/
33. Beno L, Hinchman J, Kibbe D, Trowbridge F. Design and implementation of training to improve management of pediatric overweight. *J Contin Educ Health Prof*. 2005;25(4):248-258. doi:10.1002/chp.38
34. Hinchman J, Beno L, Dennison D, Trowbridge F. Evaluation of a training to improve management of pediatric overweight. *J Contin Educ Health Prof*. 2005;25(4):259-267. doi:10.1002/chp.39
35. Dunlop AL, Leroy Z, Trowbridge FL, Kibbe DL. Improving Providers' assessment and Management of Childhood Overweight: results of an intervention. *Ambul Pediatr*. 2007;7(6):453-457. doi:10.1016/j.ambp.2007.07.006
36. Woolford SJ, Clark SJ, Ahmed S, Davis MM. Feasibility and acceptability of a 1-Page tool to help physicians assess and discuss obesity with parents of preschoolers. *Clin Pediatr*. 2009;48(9):954-959. doi:10.1177/0009922809338060
37. McKee MD, Maher S, Deen D, Blank AE. Counseling to prevent obesity among preschool children: acceptability of a pilot urban primary care intervention. *Ann Fam Med*. 2010;8(3):249-255. doi:10.1370/afm.1057
38. Watson-Jarvis K, McNeil D, Fenton TR, Campbell K. Implementing the nutrition screening tool for every preschooler (NutriSTEP®) in community health centres. *Can J Diet Pract Res*. 2011;72(2):96-98. doi:10.3148/72.2.2011.96
39. Watson-Jarvis K, Fenton TR, McNeil D, Campbell K. Preschool nutrition risk in Calgary. *Can J Diet Pract Res*. 2011;72(1):e101-e106. doi:10.3148/72.1.2011.23
40. Andrade L, Moran K, Snelling SJ, et al. Beyond BMI: a feasibility study implementing NutriSTEP in primary care practices using electronic medical records (EMRs). *Health Promot Chronic Dis Prev Can*. 2020;40(1):1-10. doi:10.24095/hpcdp.40.1.01
41. Christison AL, Daley BM, Asche CV, et al. Pairing motivational interviewing with a nutrition and physical activity assessment and counseling tool in pediatric clinical practice: a pilot study. *Child Obes*. 2014;10(5):432-441. doi:10.1089/chi.2014.0057
42. Herbenick SK, James K, Milton J, Cannon D. Effects of family nutrition and physical activity screening for obesity risk in school-age children. *J Spec Pediatr Nurs*. 2018;23(4):e12229. doi:10.1111/jspn.12229
43. Bailey-Davis L, Kling SMR, Wood GC, et al. Feasibility of enhancing well-child visits with family nutrition and physical activity risk assessment on body mass index. *Obes Sci Pract*. 2019;5(3):220-230. doi:10.1002/osp4.339
44. Gance-Cleveland B, Gilbert K, Gilbert L, Dandreaux D, Russell N. Decision support to promote healthy weights in children. *J Nurse Pract*. 2014;10(10):803-812. doi:10.1016/j.nurpra.2014.06.016
45. Park MH, Skow À, Puradiredja DI, et al. Development and evaluation of an online tool for management of overweight children in primary care: a pilot study. *BMJ Open*. 2015;5(6):e007326. doi:10.1136/bmjopen-2014-007326
46. Sharpe L, Bishop C, Devries A, Derouin A. Quick screen to intervene: starting the conversation about pediatric obesity. *J Nurse Pract*. 2016;12(10):e431-e434. doi:10.1016/j.nurpra.2016.06.009
47. Polacsek M, Orr J, Letourneau L, et al. Impact of a primary care intervention on physician practice and patient and family behavior: keep ME healthy—the Maine youth overweight collaborative. *Pediatrics*. 2009;123(Supplement_5):S258-S266. doi:10.1542/peds.2008-2780C
48. Gibson JS. Translation of clinical practice guidelines for childhood obesity prevention in primary care mobilizes a rural Midwest community. *J am Assoc Nurse Pract*. 2016;28(3):130-137. doi:10.1002/2327-6924.12239
49. Camp NL, Robert RC, Nash JE, Lichtenstein CB, Dawes CS, Kelly KP. Modifying provider practice to improve assessment of unhealthy weight and lifestyle in young children: translating evidence in a quality improvement initiative for at-risk children. *Child Obes*. 2017;13(3): 173-181. doi:10.1089/chi.2016.0124
50. Camp NL, Robert RC, Kelly KP. Healthy habits questionnaire feasibility and utility for high-risk children. *Clin Pediatr*. 2020;59(11):978-987. doi:10.1177/0009922820927030
51. Karacabeyli DS, Keidar S, Pinkney S, et al. The live 5-2-1-0 toolkit for family physicians: mixed methods evaluation of a resource to facilitate health promotion in a primary care setting. *B C Med J*. 2020;62(6):196-201.
52. Savage JS, Kling SMR, Cook A, et al. A patient-centered, coordinated care approach delivered by community and pediatric primary care providers to promote responsive parenting: pragmatic randomized clinical trial rationale and protocol. *BMC Pediatr*. 2018;18(1):293. doi:10.1186/s12887-018-1263-z

53. Shook RP, Halpin K, Carlson JA, et al. Adherence with multiple National Healthy Lifestyle Recommendations in a large pediatric center electronic health record and reduced risk of obesity. *Mayo Clin Proc*. 2018;93(9):1247-1255. doi:10.1016/j.mayocp.2018.04.020
54. Williams A, Turer C, Smith J, et al. Adoption of an electronic medical record tool for childhood obesity by primary care providers. *Appl Clin Inform*. 2020;11(2):210-217. doi:10.1055/s-0040-1705106
55. Hong QN, Fàbregues S, Bartlett G, et al. The mixed methods appraisal tool (MMAT) version 2018 for information professionals and researchers. *Educ Inf*. 2018;34:285-291.
56. Ihmels MA, Welk GJ, Eisenmann JC, Nusser SM. Development and preliminary validation of a family nutrition and physical activity (FNPA) screening tool. *Int J Behav Nutr Phys Act*. 2009;6:14.
57. Ihmels MA, Welk GJ, Eisenmann JC, Nusser SM, Myers EF. Prediction of BMI change in young children with the family nutrition and physical activity (FNPA) screening tool. *Ann Behav Med*. 2009;38(1):60-68.
58. Randall Simpson JA, Keller HH, Rysdale LA, Beyers JE. Nutrition screening tool for every preschooler (NutriSTEP): validation and test-retest reliability of a parent-administered questionnaire assessing nutrition risk of preschoolers. *Eur J Clin Nutr*. 2008;62(6):770-780.
59. Jacobson Vann JC, Finkle J, Ammerman A, et al. Use of a tool to determine perceived barriers to children's healthy eating and physical activity and relationships to health behaviors. *J Pediatr Nurs*. 2011;26(5):404-415.
60. Ray D, Sniehotta F, McColl E, Ells L. Barriers and facilitators to implementing practices for prevention of childhood obesity in primary care: a mixed methods systematic review. *Obes Rev*. 2022;23(4):e13417.
61. Bauer MS, Kirchner J. Implementation science: what is it and why should I care? *Psychiatry Res*. 2020;283:112376.
62. Nilsen P, Aalto M, Bendtsen P, Seppä K. Effectiveness of strategies to implement brief alcohol intervention in primary healthcare. *Scand J Prim Health Care*. 2006;24(1):5-15.
63. Webb MJ, Wadley G, Sanci LA. Experiences of general practitioners and practice support staff using a health and lifestyle screening app in primary health care: implementation case study. *JMIR Mhealth Uhealth*. 2018;6(4):e105.
64. Reay T, Goodrick E, Casebeer A, Hinings CR. Legitimizing new practices in primary health care. *Health Care Manage Rev*. 2013;38(1):9-19.
65. Commonwealth of Australia. National Primary Health Care Strategic Framework. In: Standing Council on Health, editor. 2013.
66. Commonwealth of Australia. National Preventive Health Strategy 2021–2030. In: Department of Health (DoH), editor. 2021.
67. Iragorri N, Spackman E. Assessing the value of screening tools: reviewing the challenges and opportunities of cost-effectiveness analysis. *Public Health Rev*. 2018;39(1):17.
68. Boland L, Kothari A, McCutcheon C, Graham ID, for the Integrated Knowledge Translation Research N. Building an integrated knowledge translation (IKT) evidence base: colloquium proceedings and research direction. *Health Res Policy Syst*. 2020;18(1):8.
69. Grimshaw JM, Eccles MP, Lavis JN, Hill SJ, Squires JE. Knowledge translation of research findings. *Implement Sci*. 2012;7(1):50.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Dutch D, Bell L, Zarnowiecki D, et al. Screening tools used in primary health care settings to identify health behaviours in children (birth–16 years); A systematic review of their effectiveness, feasibility and acceptability. *Obesity Reviews*. 2024;e13694. doi:10.1111/obr.13694

Appendix 6: NGT Workshops Reporting Checklist (STROBE) [154]

	Item No	Recommendation	Thesis Section
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	6.1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	6.2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	6.3
Objectives	3	State specific objectives, including any prespecified hypotheses	6.4
Methods			
Study design	4	Present key elements of study design early in the paper	6.5.1
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6.5.2
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	6.5.2
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6.5.3
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	6.5.3
Bias	9	Describe any efforts to address potential sources of bias	6.5.6
Study size	10	Explain how the study size was arrived at	6.5.2

Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	6.5.4
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	6.5.4
		(*b*) Describe any methods used to examine subgroups and interactions	N/A
		(*c*) Explain how missing data were addressed	
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(*e*) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	6.6.1
		(b) Give reasons for non-participation at each stage	6.6.1
		(c) Consider use of a flow diagram	6.6.1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	6.6.1
		(b) Indicate number of participants with missing data for each variable of interest	6.6.1
Outcome data	15*	Report numbers of outcome events or summary measures	6.6.2 & 6.6.3
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	N/A
		(*b*) Report category boundaries when continuous variables were categorized	N/A
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	0
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	6.7.1
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	0
Generalisability	21	Discuss the generalisability (external validity) of the study results	0
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	N/A

Appendix 7: NGT Workshops Flinders University Ethics Approval

HUMAN ETHICS LOW RISK PANEL

APPROVAL NOTICE

Dear Miss Dimity Dutch,

The below proposed project has been **approved** on the basis of the information contained in the application and its attachments.

Project No:	6514
Project Title:	Heath behaviour screening in the early years: what are the opportunities for implementation in Primary Health Care?
Chief Investigator:	Miss Dimity Dutch
Approval Date:	04/09/2023
Expiry Date:	21/12/2023
Approved Co-Investigator/s:	Dr Natasha Schranz, Professor Elizabeth Denney-Wilson, Dr Lucinda Bell, Professor Rebecca Golley
Approved Personnel:	Miss Alexandra Manson
Supervisory Panel:	Professor Elizabeth Denney-Wilson, Dr Lucinda Bell, Professor Rebecca Golley

Please note: *For all research projects wishing to recruit Flinders University students as participants, approval needs to be sought from the Pro Vice-Chancellor (Learning and Teaching Innovation), Professor Michelle Picard. To seek approval, please provide a copy of the Ethics approval for the project and a copy of the project application (including Participant Information and Consent Forms, advertising materials and questionnaires etc.) to the Pro Vice-Chancellor (Learning and Teaching Innovation) via michelle.picard@flinders.edu.au.*

Appendix 8: NGT Workshops Women's and Children's Health Network Ethics Approval

From: no_reply@gems.sahealth.sa.gov.au
To: Dimity Dutch
Subject: 2023/HRE00322: Application HREA - Approved
Date: Wednesday, 13 December 2023 4:05:14 PM

CAUTION: Only open links and attachments you're expecting.

Approval date: 13 Dec 2023

Dear Dimity Dutch,

Thank you for submitting the following Human Research Ethics Application (HREA) for HREC review;

2023/HRE00322: Heath behaviour screening in the early years: what are the opportunities for implementation in Primary Health Care?
HREA version: 1.01
Submission date: 13 Dec 2023

This project was first considered by the Women's and Children's Health Network Human Research Ethics Committee at its meeting held on 6 December 2023 in which more information was requested. Thank you for your response dated 13 December 2023 which was reviewed by the HREC Chair out of session.

I am pleased to inform you that this project has been approved, after being determined to meet the requirements of the National Statement on Ethical Conduct in Human Research (2007, updated 2018) (NHMRC).

The approval is for a period of 3 years from the date of this e-mail (13 Dec 2023) , on condition of the submission of annual reports for both ethics and governance applications.

This project has been approved to be conducted at the following sites:

- Women's and Children's Hospital

Appendix 9: NGT Workshops Women's and Children's Health Network Site Specific Approval

From no_reply@gems.sahealth.sa.gov.au <no_reply@gems.sahealth.sa.gov.au>
Date Mon 2024-02-05 01:52
To fiona.grant@sa.gov.au <fiona.grant@sa.gov.au>
Cc Dimity Dutch <dimity.dutch@flinders.edu.au>

CAUTION: Only open links and attachments you're expecting.

Date of Decision Notification: 05 Feb 2024

Dear Fiona Grant,

Thank you for submitting the following Site Specific Assessment (SSA) for research governance review; **2023/SSA00784: Health behaviour screening in the early years: what are the opportunities for implementation in Primary Health Care?**

The Application has been reviewed by the Chief Executive/Delegate who has determined the application is now authorised at this site: **Women's and Children's Hospital**

The following documentation is included in this authorisation:

- SSA form 2023/SSA00784 v1_01 - v1_02 Changes
- HREA
- HREC decision notification -13-12-2023
- WCHN Ethics Protocol_Child Health Behaviour Screening Workshops
- Pre-workshop information and agenda-1-14-Nov-2023
- Workshop Notetaking Document - Blank-1-14-Nov-2023
- Demographic Questionnaire-1-14-Nov-2023
- Participant Information Sheet & Consent Form-1-14-Nov-2023
- Participant Communication - Thank you for registering-1-14-Nov-2023
- Direct email invitation-1-14-Nov-2023
- NGT Workshops Promotional Flyer-2-23-Jan-2024
- HREC Confidentiality Agreement Form-DDutch-1-23-Jan-2024
- Fiona Grant Local PI CV-1-23-Jan-2024
- Dimity Dutch CPI CV-1-23-Jan-2024
- Working with Children Check - DDutch-1-23-Jan-2024
- Application Documents

Appendix 10: NGT Workshops Participant Recruitment Information

Appendix 10a: Direct Email Invitation Template

Dear [insert name],

RE: Invitation to take part in a workshop 'Screening for health behaviours in the early years: what are the opportunities for implementation in primary health care?'

The Centre for Research Excellence in Translating Early Prevention of Obesity in Childhood (EPOCH-Translate CRE), alongside the Flinders Caring Futures Institute and Wellbeing SA are exploring opportunities within the primary health care system to support the development of lifelong healthy behaviours (diet, activity, screen use and sleep) in early childhood (0-5 years).

As a health practitioner who works with young children in primary health care/As an organisation for primary health care practitioners, we would like to invite you/your members to be part of a workshop to discuss opportunities to implement child health behaviour screening in primary health care.

The 2-hour interactive workshops will take **place during September-October 2023 and will be held online via Microsoft Teams.** Workshops dates and times will be set according to participant availability.

Please see attached information sheet for more details. This project has been approved by Flinders University's Human Research Ethics Committee (Project ID 6514).

Your/Members of your organisation/associations input into the workshop would be a highly valuable contribution to this project.

If you are interested in being involved, please visit https://qualtrics.flinders.edu.au/jfe/form/SV_3mIZ6QfuRFAg7tk to:

1) **Read the detailed participant information sheet and, if you wish to take part, sign the consent form**
2) **Complete the registration survey to indicate your preference and availability to attend a workshop**

Please feel free to circulate this email and attached information with your networks.

Please contact Dimity (dimity.dutch@flinders.edu.au) if you would like further information about this project.

Kind regards,

Dimity and Rebecca

Dimity Dutch
PhD Candidate
Caring Futures Institute,
College of Nursing and Health Sciences,
Flinders University
E: dimity.dutch@flinders.edu.au
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Professor Rebecca Golley
Professor (Research) and Deputy Director Caring Futures Institute,
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E: rebecca.golley@flinders.edu.au

Flinders University | Caring Futures Institute | Government of South Australia | Wellbeing SA

epoch – Translate
Translating Early Prevention of Obesity in Childhood

Appendix 10b: Social Media Recruitment Information

Social Media Post Caption

Are you a primary health care practitioner working with young children (birth to five years)? The CRE EPOCH-Translate, with the Flinders Caring Futures Institute and Wellbeing SA, are conducting interactive idea generation workshops in September/October to explore opportunities in primary health care to screen for child health behaviours in the early years. This project has been approved by Flinders University's Human Research Ethics Committee (Project ID 6514).

To get involved in a workshop or find out more information visit https://qualtrics.flinders.edu.au/jfe/form/SV_3mIZ6QfuRFAg7tk

Appendix 11: NGT Workshops Participant Information and Consent Form

Flinders University

PARTICIPANT INFORMATION SHEET AND CONSENT FORM

Title: Screening for health behaviours in the early years: what are the opportunities for implementation in Primary Health Care?

Chief Investigator
Miss Dimity Dutch
College of Nursing and Health Sciences
Flinders University
Tel: 08 8432 4072

Co-Investigators/Supervisors
Dr Lucinda Bell
College of Nursing and Health Sciences
Flinders University

Professor Elizabeth Denney-Wilson
Faculty of Medicine and Health
The University of Sydney

Dr Natasha Schranz
Early Years, Children and Young People
Prevention and Population Health Directorate
Wellbeing SA

Professor Rebecca Golley
College of Nursing and Health Sciences
Flinders University

Researchers
Miss Alexandra Manson
College of Nursing and Health Sciences
Flinders University

Description of the study
We want to identify opportunities for implementing health behaviour screening in primary health care, to support the development of lifelong healthy behaviours (including food intake, physical activity, screen use and sleep) from a young age. This project is conducted by the Centre for Research Excellence in

Translating Early Prevention of Obesity in Childhood (EPOCH-Translate CRE) and Caring Futures Institute, Flinders University, and is supported by Wellbeing SA.

Purpose of the study

The workshops aim to engage a range of South Australian primary health care practitioners to:

1. Generate key features of a child health behaviour screening tool for use in primary health care
2. Understand the supports needed to implement child health behaviour screening in primary health care

The outcome of the workshops will support the development of a co-designed child health behaviour screening tool and an understanding of practitioner-identified supports need to enable adoption of the health behaviour screening tool in Primary Health Care settings.

Benefits of the study

Participants will be providing a valuable contribution to the scientific knowledge in this area. This will inform future research and assist health professionals to better support caregivers through their settings and services to improve health behaviours from early childhood. You will also have the option to register your interest to receive information via email about future research you may be eligible to take part in.

Participant involvement and potential risks

If you agree to participate in the research study, you will be asked to:

- attend a virtual workshop with other health practitioners that will be audio recorded
- provide brief demographic information including your years of professional experience

The workshop will take about 2 hours and participation is entirely voluntary. The workshop will include an introductory presentation to provide context to the research and the workshop process. You will then be facilitated through an orderly and collaborative process which is designed to generate, filter and prioritise ideas and solutions to our two key questions regarding child health behaviour screening. The four stage process includes silent idea generation, round robin discussion, clarification and voting.

The researchers do not expect the questions to cause any harm or discomfort to you. However, if you experience feelings of distress as a result of participation in this study, please let the research team know immediately.

Withdrawal Rights

You may decline to take part in this research study. If you decide to take part and later change your mind, you may, withdraw at any time without providing an explanation. To withdraw, please contact the Chief Investigator to have your data removed from the study or you may just refuse to answer any questions or leave the workshop. Data recorded during focus group discussions may not be able to be destroyed due to it being collected in a group discussion. However, the data will not be used in this research study without your explicit consent.

Confidentiality and Privacy

Participating in the workshop(s) will mean that the researchers and other participants will be aware who has participated. Group workshops discussions will be audio recorded and transcribed using Microsoft Teams software, meaning that the name you chose to login with will be visible to other participants and will be recorded.

Only researchers listed on this form have access to the individual information provided by you. Privacy and confidentiality will be assured at all times. The research outcomes may be presented at conferences, written up for publication or used for other research purposes as described in this information form. However, the

privacy and confidentiality of individuals will be protected at all times. You will not be named, and your individual information will not be identifiable in any research products without your explicit consent.

No data, including identifiable, non-identifiable and de-identified datasets, will be shared or used in future research projects without your explicit consent. Please provide your consent to this by ticking the appropriate box on the Consent Form at the end of this form.

Data Storage

The information collected will be stored securely on a password protected computer and/or Flinders University server throughout the study. Any identifiable data will be de-identified for data storage purposes unless indicated otherwise. All data will be securely transferred to and stored at Flinders University for seven years after publication of the results. Following the required data storage period, all data will be securely destroyed according to university protocols.

Recognition of Contribution

If you would like to participate, in recognition of your contribution and participation time, you will be paid sitting fees according to current published rates for sitting fees $35 per hour (2 hour workshop + one hour preparation time), total up to $105 per workshop to cover potential loss of income. Sitting fees will be paid upon completion of the workshop. You can waive payment of sitting fees if you wish.

Child and Family Health Service (CaFHS) staff will be supported to participate during their workload/role and therefore won't be remunerated as per organisational policy as there will be no associated loss of income.

How will I receive feedback?

Results from each workshop will be shared with participants prior to the completion of the workshop. The results from this study will be published in scientific journals, but individual participants will not be identifiable.

Ethics Committee Approval

The project has been approved by Flinders University's Human Research Ethics Committee (HREC Project Number 6514).

Queries and Concerns

Queries or concerns regarding the research can be directed to the research team. If you have any complaints or reservations about the ethical conduct of this study, you may contact the Flinders University's Research Ethics and Compliance Office team either via telephone (08) 8201 2543 or by emailing the Office via human.researchethics@flinders.edu.au.

Thank you for taking the time to read this information sheet which is yours to keep.

If you accept our invitation to be involved, please sign the enclosed Consent Form.

CONSENT FORM

Title: Screening for health behaviours in the early years: what are the opportunities for implementation in Primary Health Care? (HREC Project Number 6514)

Consent Statement

☐ I have read and understood the information about the research, and I understand I am being asked to provide informed consent to participate in this research study. I understand that I can contact the research team if I have further questions about this research study.

☐ I am not aware of any condition that would prevent my participation, and I agree to participate in this project.

☐ I understand that I am free to withdraw at any time during the study.

☐ I understand that I can contact Flinders University's Research Ethics and Compliance Office if I have any complaints or reservations about the ethical conduct of this study.

☐ I understand that my involvement is confidential, and that the information collected may be published. I understand that I will not be identified in any research products.

☐ I understand that I will be unable to withdraw my data and information from this project. I also understand that this data <u>will be used</u> for this research study.

I further consent to:

☐ completing a questionnaire
☐ participating in a group workshop discussion
☐ having my information audio recorded
☐ being contacted with an invitation to participate in the consensus workshop
☐ sharing my de-identified data with other researchers
☐ my data and information being used in this project and other related projects for an extended period of time (no more than 7 years after publication of the data)
☐ being contacted about other research projects

Signed: _____

Name: _____

Date: _____

Appendix 12: NGT Workshops Participant Demographic Questionnaire

(*collected via a Qualtrics questionnaire)

Please answer all questions

1. Name: _____
2. Preferred contact email: _____
3. What gender do you identify as?
   a. Male
   b. Female
   c. Non-binary / third gender
   d. Prefer not to say
4. What is your current role?
   a. Paediatrician
   b. General Practitioner
   c. Practice Nurse
   d. Child and Youth Health Nurse
   e. Nurse Practitioner
   f. Health Service Manager
   g. Speech Pathologist
   h. Occupational Therapist
   i. Physiotherapist
   j. Dietitian
   k. Other (please specify:_____)
5. How long have you worked as a [pipe response to question 4]?
   a. _____ weeks, or
   b. _____ months, or
   c. _____ years
6. Please select your availability to participate in the ideas workshops? (select all options you are available)
   a. Day and date 1
   b. Day and date 2

c. Day and date 3

d. Day and date 4

e. None of the above – suggest alternative availability

7. Refreshments will be offered in the workshop. Please list any dietary requirements

_____

8. Are you interested in receiving information via email about future research you may be eligible to take part in? *(note this information will be stored securely and only be accessible to the research team)*

   If yes, please include your preferred email address for future communication:

   _____

   ___

Thank you for registering your interest in this project. We will contact you via your preferred email to confirm workshop details and your participation.

If you have any questions, please don't hesitate to contact Dimity at dimity.dutch@flinders.edu.au

Appendix 13: Data collection documents for NGT Idea Generation Workshops

Appendix 13a: Idea generation workshop notetaking document

2. ROUND ROBIN

3. GROUP DISCUSSION

Imagine a screening tool for child health behaviours. What are the key features of a tool to enable effective use in your practice?

Idea Name	Idea Comments/Description

2. ROUND ROBIN

3. GROUP DISCUSSION

What training, resources and supports would you need to implement screening in your practice?

Idea Name	Idea Comments/Description

Appendix 13b: Example of idea generation workshop online voting form

What are the key features of a tool to enable effective use in your practice?

- [ ] Accessibility (ESL appropriate etc.)
- [ ] Automation
- [ ] Categories
- [ ] Examples
- [ ] Pictures
- [ ] Number of questions
- [ ] Fast and brief
- [ ] Simple and easy to fill out
- [ ] Ability to be used by multi-disciplinary teams
- [ ] Language and definitions
- [ ] Gender/sex considerations

What would you need to implement screening in your practice?

- [ ] IT support to create document/IT contact
- [ ] Report of results
- [ ] Funding
- [ ] Modules or video training
- [ ] Scoring guides
- [ ] Certification
- [ ] Client examples
- [ ] Concise 'manual'
- [ ] Prompts for next steps
- [ ] Free to access
- [ ] Advertisement of tool

How did you find today's workshop? Any comments/feedback for improvement?

Appendix 14: Data collection documents for NGT Consensus Workshop

Appendix 14a: Consensus workshop notetaking document

Q1: What are the key features of a screening tool to enable effective use in your practice?

Themed tool features	**Synthesised from the following original ideas**	**Consensus Discussion Points**
Tool length Brief 10-24 questions in length i.e. up to 6 per health behaviour domain <2 A4 pages as paper version Acceptable to practitioners and parents Motivation to use a shorter/brief tool, length is a barrier to completion due to limited time Opportunity for brief screener and comprehensive assessment versions Opportunity for sections/domains to stand alone and completed in isolation, as well as in combination	Fast and brief (W1) Number of questions (W1) Easy to read / complete (W3) Easy to administer and interpret (W4) Acceptable to stakeholders (W4) Short (W5) Screening vs assessment (W5) Easy for parents to use (W6)	
Question design and response format Use of Likert scales, multiple choice, and tick-box response options Initial questions designed to identify need for support, rather than quantifying behaviours Questions designed to capture quality and quantity of health behaviours	Simple and easy to fill out (W1) Categories (W1) Response categories / options (W2) Age specific (W3) Acceptable to stakeholders (W4) Quality of information (W5) Question types (W5)	

Opportunity for parents to elaborate in 'free text' responses Prompts for parents to flag any concerns or request further support Acceptable to parents – easy to fill out Age-specific versions of the tool i.e. 0-1yo, 1-3yo and 3-5yo	Parent reflective of behaviours (W6) Easy for parents to use (W6)	
Images and visuals Visual and engaging tool Images to support interpretation of questions Examples to define what behaviours are and prompt parents responses	Examples (W1) Pictures (W1) Acceptable to stakeholders (W4) Easy for parents to use (W6)	
Psychometric properties Tool sensitivity and specificity Tool needs to accurately identify children that require further assessment or support and not lead to over-referrals or false positives	Validity (W4)	
Technological functions Integrated and embedded into medical practice software allowing for flag reminders, documentation and ongoing monitoring Link to screening tool can be sent with appointment reminder to enable pre-appointment completion QR codes in the waiting room to support distribution and administration Parent can scan and complete on own device	Automation (W1) Flexible mode of delivery (W2) When it is completed (W2) QR code used (W3) Embedded into medical software (W3) Easy to administer and interpret (W4)	

Automated scoring with clear results flagging support needs or referral pathways Automated production of report to provide feedback to parents		
Administration methods Electronic and paper-based versions available Ability for caregiver OR practitioner completion Opportunity to complete prior to consult (at home or in the waiting room) or during the consult	Simple and easy to fill out (W1) Flexible mode of delivery (W2) When it is completed (W2) Family led, clinician supported (W2) Online – with in person option (W3) Format – online, survey, paper (W4) Timing of completion (W4, W5, W6) Mode of completion (W5) Acceptable to parents and children (W5) Online version (W6)	
Clear results and next steps Tool results provide clear feedback on next steps for parents and practitioners Screen acts as an educational tool Easy to interpret results i.e. traffic light system categories Scores calculated easily Links to relevant guidelines, resources and referral pathways	Built-in education (W2) Graphic results (W3) Clear cut off criteria (W4) Intervention available (W4) Quantifiable (W5) Clear direction (W5)	
Inclusive and accessible language	Language and definitions (W1) Accessibility (ESL appropriate etc.) (W1)	

Shame avoidant language that is non-judgemental and inclusive Accessible and simple English Strengths-based and positive framing to identify what health behaviours they are doing well and empower parents on what can be improved	Gender (W1) Accessible language and visuals (W2) Built-in education (W2) Non-judgemental (W3) Inclusive (W3) Culturally appropriate (W3) Acceptable to stakeholders (W4) Shame avoidant (W5) Language and framing (W6)	
Multidisciplinary and sector use Not exclusive to one discipline or sector Able to be used in settings where children and families are already visiting in the early years Multidisciplinary and multi-sector use reaffirms consistent messaging	Ability to be used by multidisciplinary teams (W1) Able to be used in community and health sector (W4) Credibility (W5)	

Q2: What training, resources and supports would you need to implement screening in your practice?

Themed training and support needs	**Synthesised from the following original ideas**	**Consensus Discussion Points**
Practitioner training Training on how to administer the tool and how to score, interpret and apply results to ensure consistency Training on the social determinants of health	Modules or video training – practitioner and parents (W1) Certification (W1) Training (W2)	

Training on communication and counselling skills – inclusive language, motivational interviewing and strengths-based framing Training for all practice staff – including admin, practice managers and practitioners Videos to support different learning styles Limited or no training required, but available if desired CPD points or certification available Refresher training available on guidelines and recommendations	Online training modules / resource (W3) Motivational interviewing skills / communication skills (W3) Training practitioner (W4) Training (W6)	
Practitioner resources Practitioner manual or suite of resources including; - Why the tool is important - How to administer the tool - Client examples - Scoring guides - Conversation prompts and communication guide - Clear recommendations, resources, and referral pathways Potential for resources (practitioner and caregiver) to be hosted online as part of an Information Resource Hub (updated regularly)	Scoring guides (W1) Prompts for next steps (W1) Concise manual (W1) Client examples (W1) Practitioner information sheets (W2) Outcomes data (W3) Pathway to follow up (W4) Clear instructions, resources and next steps for practitioners (W5) Referral pathways (W6) Conversation prompts for practitioners (W6) Information hub (W6) Resources for practitioners on next steps (W6)	

Caregiver resources Videos to enable caregiver completion i.e. suitable for rural and remote settings via Telehealth Caregiver resource sheets, online information, links to other resources and support groups that are engaging and applicable across the family Resource sheets include; - 'About the tool' fact sheet including why the tool is important - Evidence and strengths-based resources on health behaviour recommendations - Resources available in languages other than English - Colouring sheets and stickers for children Potential for resources (practitioner and caregiver) to be hosted online as part of an Information Resource Hub (updated regularly). Practitioners can tailor information provided by providing appropriate resources at the time.	Modules or video training – practitioner and parents (W1) Caregiver information (W2) Consistent health messages and guidelines (W3) Support for parents (W4) Patient resources (W5) Engageable format (W5) – *MOVED FROM Q1* Applicable across the family (W5) – *MOVED FROM Q1* Staged resources (W5) – *MOVED FROM Q1* Parent resource (W6) Information hub (W6)	
Community awareness Advertisement and promotion of the tool to raise awareness amongst caregivers and practitioners – videos, emails, subscription, attendance at relevant events	Advertisement of tool (W1) Certification (W1) Community awareness (W2, W5)	

Waiting room videos and posters to raise awareness Practitioner certification to increase awareness and recognition Embedding tool within resources already accessed including relevant practice guidelines and caregiver apps and websites	Motivation to complete & change (W3) – *MOVED FROM Q1* Preliminary scene setting resource (W5) – *MOVED FROM Q1*	
Access and availability Free to access and use, ensuring populations at most risk can access for free Able to be adapted and tailored to various medical practice software programs Integrating into existing routine services including the Blue Book provided by the Children and Family Health Service and My Health Record	Free to access (W1) Able to be tailored for online systems (W3) Accessible (W5) Integration into routine practice (W5)	
Workplace and IT support Workplace and managerial support for implementation and sustained use of tool in routine practice Admin support with dissemination, promotion and reminders to enable consistent and accurate tool completion IT support to create engaging screening tool, automated scoring and generation of a report of results IT structures and systems to allow results to be shared amongst practitioners Ensure that children that are flagged are being followed up	IT support to create document / IT contact (W1) Funding (W1) Workplace structures / systems / supports (W2) Appropriate admin support for specific practice (W3) Follow up mechanisms (W4) Support from the MBS to implement (W4) Time in consult (W6)	

Consider funding, copyright and associated costs of distribution and keeping up to date Medicare Benefit Schedule (MBS) item to enable appropriate billing and time allocation to complete/discuss in consult		
Interprofessional exchange and communication Shared results and communication between practitioners to reduce repeated completion, children being missed, and ensure consistent messaging in recommendations Network of professionals to enable cross-sector collaboration and care Communication channel to enable referral pathways and feedback results and close the loop including resources and supports provided and outcomes	Report of results (W1) Interprofessional exchange of information (W2) Network of professionals across different domains (W2) Sharing results (W4) Communication between practitioners (W5)	
Tool monitoring and evaluation Monitoring uptake and completion of the tool and identifying any barriers Evaluation of tool implementation including training provided, acceptability to parents and practitioners and efficacy as a tool to support children's health behaviours	Monitoring uptake (W4) Ongoing evaluation of the efficacy of the tool (W4) Tracking (W5)	

Appendix 14b: Consensus Workshop Voting Form

Flinders University

Thank you for participating in consensus voting for workshop 'Screening for health behaviours in the early years: what are the opportunities for implementation in Primary Health Care?'

Please provide your votes for the following two questions by giving a '3' for your top priority, '2' for your second priority, and '1' for your third priority.
Please leave all other options blank.

What are the key features of a tool to enable effective use in your practice?

- [ ] Tool length
- [ ] Question design and response format
- [ ] Image and visuals
- [ ] Psychometric properties
- [ ] Technological functions
- [ ] Administration methods
- [ ] Clear results and next steps
- [ ] Inclusive and accessible language
- [ ] Multi-disciplinary and sector use

What would you need to implement screening in your practice?

- [ ] Practitioner training
- [ ] Practitioner resources
- [ ] Caregiver resources
- [ ] Community awareness
- [ ] Access and availability
- [ ] Workplace and IT support
- [ ] Interprofessional exchange and communication
- [ ] Tool monitoring and evaluation

Appendix 15: NGT Workshops Participant Quotes

Idea	Relevant quotes
TOOL FEATURES	
Clear results and next steps	‘Do you know what that makes me think would be really cool to have an export function if you like. So a little summary at the end that you could print out and give to the family.’ (GP practitioner, Workshop 2) ‘I think what you'd need this to be is a screening tool. So to highlight if there is an issue rather than finding out exactly what the issue is, you need to then it needs to flag that the practitioner needs to follow up on this particular thing to kind of dig deeper into that.’ (GP practitioner, Workshop 3) ‘The scoring would need to be easy to interpret and provide clear feedback like on next steps and maybe links to guidelines.’ (GP practitioner, Workshop 4) ‘Part of ease of use is the ability to quickly analyse the data and determine whether it's a screening pass or the child needs further assessment.’ (Allied Health practitioner, Workshop 4) ‘I think the things that have been helpful is of course that it be short and something that's quantifiable and particularly if you're going to repeat that process down the track to assess progress and I'm increasingly learning that it absolutely needs to be acceptable to parents as well as children.’ (GP practitioner, Workshop 5) ‘It needs to be very clear around, you know, this leads to this leads to this referral and not leaving a gap for those offhand recommendations.’ (Allied Health practitioner, Workshop 5)

	‘screening tools are screening tools, but they're also often conversation tools. So that's where, and then there are assessments…so I think inevitably screening tools, in my experience, they're largely, their most important purpose for me is usually that it's a conversation starter and a conversation tool’ (Allied Health practitioner, Workshop 5) ‘So you know how we talk about like a referral pathways because there's no point in doing anything like this if there's no information available or no option for someone to further explore it.’ (Child and Family Health nurse, Workshop 7) ‘At the beginning of it, parents could identify if they want a copy of the results or not, and then the formal report comes through to the practitioner as a result of all the answers they gave’ (Child and Family Health nurse, Workshop 7) ‘Clear scoring and referral pathways could be helpful’ (Child and Family Health nurse, Workshop 7) ‘Know that there’s that dedicated referral pathway or resource that we can promote and use and that way we don’t necessarily have to give all the information in one go’ (Child and Family Health nurse, Workshop 7) ‘I guess we need to have some way of determining what the results of this I'm tool, what what results is giving us and you know whether the child needs further supports to be put in place or whether they're tracking within normal range’ (Child and Family Health nurse, Workshop 8)
Question design and response format	‘It gives little tips and tricks as part of the screen….so the screen also acts as an educational tool.’ (GP practitioner, Workshop 2)

	‘Broken down into the section. So it's not too overwhelming so that they could focus on one of the areas of health behaviour and and then, yeah, easy to use pretty much like photos, tick boxes. (Allied Health practitioner, Workshop 2) ‘Thinking busy parents, just things being like short and easy to read practically cause like we with some of our current forms that we do have, they are quite lengthy and that's a barrier to them actually doing them before an appointment.’ (Allied Health practitioner, Workshop 3) ‘something quite easy for parents to use, so something quite simple tick box type questionnaire, but then having room to elaborate on some of the sort of more key points’ (Allied Health practitioner, Workshop 6) ‘I think for me underlying all of this is just really having that clarity around what's the purpose of the tool…if what we're wanting it to be is something that's going to promote those positive conversations, that really enables parents to engage with it and kind of look for ways to build on what they're doing and that that would be sort of the thing that I think needs to underpin it all for it to be a helpful thing.’ (Allied Health practitioner, Workshop 6) ‘I feel like a lot of the time when parents come in here, they already know, like they already know that they're doing too much screen time, they already know that they're not eating enough vegetables and they're really, really worried about it. It's actually we don't need to increase I guess awareness and anxiety around those things because it's already there, but it's like if it was actually to be helpful, it would be what are the barriers’ (Allied Health practitioner, Workshop 6)

	‘I think you just gonna have short questions as well though like to the to the point short questions to the point probably some like, you know Scott scaled answering but then an opportunity to express concerns if there are any, yeah.’ (Child and Family Health nurse, Workshop 7) ‘I guess it might be like coming up with the questions and then condensing it down to what are the most important ones that will guide us in our conversation with the parents?’ (Child and Family Health nurse, Workshop 7) ‘There be like each heading might be say, Nutrition and then sleep screen time, physical activity and then maybe within that each heading there might be 3 or 4 questions on but each section and then there could be like a section at the bottom that says ‘Do you have any other areas of concern or any other comments about your child's sleep’ or under each heading?’ (Child and Family Health nurse, Workshop 7) ‘It has to be understandable, simple to use, suitable for different ages, sexes, cultures, possibly something similar to the ASQ.’ (Child and Family Health nurse, Workshop 8) ‘I'd like to see a tool that electronic and user friendly and it's customized so it can be age-appropriate bit like the ASQ that's age appropriate for their age.’ (Child and Family Health nurse, Workshop 8)
Tool length	‘I would say that you know something that's fast and brief to keep it doable during initial learner assessment process and probably adding on to simple and easy to fill so that a practitioner can do that quickly, but also it can delegate that to the family or maybe some carers to support them and feeling as well.’ (Allied Health practitioner, Workshop 1)

	‘That way it's really quick and I'm more motivated to use it as a beginning process and then to prop myself to make any referrals or have to, you know, guide the parent into having any sort of education or more resources as well.’ (Allied Health practitioner, Workshop 1) ‘I I'd like to know that if I was doing the screen or a family went home and did the screen, they could click on one of those, which should be very quick and easy, rather than having to write down, you know, monitor their child for a week and ohh they move on average 30 minutes.’ (GP practitioner, Workshop 2) ‘It would need to be concise or brief. So probably one to two page or 10 or 15 questions maximum.’ (GP practitioner, Workshop 4) ‘Honestly, as a rural GP, we just don't have time, you know, and if people bring their child in for some other issue, say they've come in about eczema or behavioural issues or whatever, you know, often you're spending the entire consult dealing with the issue at hand and there's limited time to actually look at, well, child screening and discussions’ (GP practitioner, Workshop 4) ‘I think the things that have been helpful is of course that it be short and something that's quantifiable and particularly if you're going to repeat that process down the track to assess progress and I'm increasingly learning that it absolutely needs to be acceptable to parents as well as children.’ (GP practitioner, Workshop 5) ‘There be like each heading might be say, Nutrition and then sleep screen time, physical activity and then maybe within that each heading there might be 3 or 4 questions on but each section and then there could be like a section at the bottom that says ‘Do you have any other areas of concern or any other comments about your child's sleep’ or under each heading?’ (Child and Family Health nurse, Workshop 7)

Clear purpose	‘There has to be some meaning to the client to do this….there has to be some sort of motivation’ (Child and Family Health nurse, Workshop 7) ‘Important to have like a bit of an explanation as to why we’re doing the tool…a brief statement as to why it’s important’ (Child and Family Health nurse, Workshop 7) ‘Demonstration of the purpose behind doing the tool, and the magnitude of primary health care at this age’ (Child and Family Health nurse, Workshop 8)
Inclusive and accessible language	‘One of my soapboxes is to normalize and strength-based behaviour change. So your screen is already an educational tool that helps families feel good that they're even filling out the screen rather than guilty and bad that they having to do a screen because they're not doing it right.’ (GP practitioner, Workshop 2) ‘I think also the wording of it needs to be really simple and clear because we work with a lot of people where their children are actually reading the forms for them.’ (Allied Health practitioner, Workshop 2) ‘If the way that the tool was kind of designed and set up and the prompts on it were quite strengths-based, it could be really useful for everybody that uses it’ (Allied Health practitioner, Workshop 6) ‘Working in partnership with parents that it's not that sense of we’re the expert and we're going to tell you all the things that you need to do that that as a parent, you're part of that journey of what the therapeutic experience looks like. So it's not just experts giving you the information and telling you how it should be.’ (Allied Health practitioner, Workshop 6) ‘Not using really difficult language, so easy to understand’ (Child and Family Health nurse, Workshop 7)

	‘No matter what mode of delivery it is, I think it just needs when it says easy to understand, I just think of the language that's used and probably when you think of the ASQ, it's like a year five level.’ (Child and Family Health nurse, Workshop 8)
SUPPORT NEEDS	
Practitioner training	‘I like the just quick to shoot like this is like how they're quickly like this is an example of how to administer it so that if you were to pick it up that it's consistent in presentation and it's delivery. But to be quite honest, a barrier is that if the video is over 10 minutes of training, I'm probably just gonna wing it and just see how I go and learn from that.’ (Allied Health practitioner, Workshop 1) ‘And I'm going to be the devil's advocate for my first gut visceral response was very little training needed for the tool, so I think training is highly valuable. Making available is wonderful, but I see very little as actually being critical to being implemented and very and tools that get picked up easily don't need a lot of training…. So you want it to be something that you can just pick up and run with.’ (GP practitioner, Workshop 2) ‘Ensuring that your practitioners have a good sort of understanding of the purpose of the tool and the background and the outcomes and how we can use it.’ (GP practitioner, Workshop 3) ‘Part of any screening tool, it is educating the practitioner on why is this important’ (GP practitioner, Workshop 2) ‘Having access to good quality training for the practitioner and they get and what understanding, what setting this tool will be sort of administered.’ (GP practitioner, Workshop 3) ‘I would hope if it was an easy enough tool to use that you wouldn't need any additional training. And if anything, as a GP, I'd probably just prefer more of a refresher on the next step side of things like the guidelines for child

	Health, for example, the recommendations and the evidence base around screen time.' (GP practitioner, Workshop 4) 'I was thinking for it to be as simple as you could pick it up, read it and use it, though there is training available for those who want it or QR links or something to training. But I yeah, I really do think it needs to be a pickup, quite readable, very comprehendible, and you can use it straight away given that you're providing it in a healthcare profession setting or parent led.' (Allied Health practitioner, Workshop 5) 'Some kind of training or some like, even if it's not a face-to-face training, but like some kind of guide guiding document guide book or like an online thing that's easier or something explaining why it's been framed in this way and the importance of actually using it in this way that strengths-based to actually promote healthy behaviours and not just create pressure which then actually reduces healthy behaviours.' (Allied Health practitioner, Workshop 6) 'I think maybe in terms of education for the practitioner, I think even though I suggested that eLearning and the MS Teams, sometimes they like face-to-face Workshop is better for engaging.' (Child and Family Health nurse, Workshop 7) 'So you could do like a face-to-face on commencement of working for the service and then it could be annual or every couple of years as an eLearning refresher or something like that, I guess.' (Child and Family Health nurse, Workshop 7)

Access and availability	If it's not facilitated by a practitioner that whether it's accessible on websites for families just to build that awareness to see if that helps educate them or just to raise a red flag if they didn't know that it was, you know, be on the recommendations. (Allied Health practitioner, Workshop 1) Free to access always helps with more people doing that screening, which then helps with that sort of systemic change as well. (Allied Health practitioner, Workshop 1) ‘I I'd love it to become normalized if you like that it's not a screen and I've sort of said this, but that it becomes a routine thing you do with the six-month vaccinations or the 12-month vaccinations, almost like part of the Blue Book Club having SA that this.’ (GP practitioner, Workshop 2) ‘Have the screen as part of their routine care, so piggybacking it or in meshing it, or linking it with other common presentations for kids in that first thousand days would be really good.’ (GP practitioner, Workshop 2)
Practitioner resources	‘And I was thinking the about fact sheet could be about the screen and where it comes from that sort of gives an overarching view that you can, you know, give to a colleague or look, here's this screening tool. Here's the links to the to the forms. Here's the links if you want to further reading or background.’ (GP practitioner, Workshop 2) ‘Support for practitioners with regarding like positive engagement with family.’ (GP practitioner, Workshop 3) ‘Exact wording or scripts that the health practitioner could use to kind of keep it on track.’ (Allied Health practitioner, Workshop 5)

	‘Screening tools are screening tools, but they're also often conversation tools…so I think inevitably screening tools, in my experience…the most important purpose for me is usually that it's a conversation starter and a conversation tool’ (Allied Health practitioner, Workshop 5) ‘Some kind of training or some like, even if it's not a face-to-face training, but like some kind of guide guiding document guide book or like an online thing that's easier or something explaining why it's been framed in this way and the importance of actually using it in this way that strengths-based to actually promote healthy behaviours and not just create pressure which then actually reduces healthy behaviours.’ (Allied Health practitioner, Workshop 6) ‘Milestones or guidelines for the practitioner to kind of support those conversations or and some recommendations or like some prompts’ (Allied Health practitioner, Workshop 6) ‘Here's a resource that I could look at that sort of says, well, I could support parents to go here, or they could access this thing. Or, you know, this organization does XY&Z’ (Allied Health practitioner, Workshop 6) ‘It would be great if we could have some structure in ways that we can discuss it at each appointment…’ (Child and Family Health nurse, Workshop 7)
Staff roles and capacity	‘I also just can’t see that happening within CaFHS at the moment, with how much they’re expecting us to do within the new scheduling program’ (Child and Family Health nurse, Workshop 7) ‘We need to adjust length of appointments or additional appointments that we can book families into if they would like some specific support on healthy lifestyle’ (Child and Family Health nurse, Workshop 7)

	‘I think you need someone that's specifically like, yes, really passionate and really knowledgeable and experienced with supporting staff to learn how to have these conversations’ (Child and Family Health nurse, Workshop 7)
Interprofessional exchange and communication	‘If you're completing this at your GP and then you get referred and you get referred to an allied health and then you get asked to complete it again and you know all of those kinds of things that would be quite annoying for families and overwhelming. So reducing the repetition and being kind of that, yeah, you know that if you're referred from that GP, they get permission to share that information.’ (Allied Health practitioner, Workshop 2) ‘A network where other practitioners know about it, cause what happens if you refer out to someone and they you get sent this form. You're like, what is this tool?....What is this doctor sending me? What is this person trying to tell me with this thing? So yeah, some sort of network where you know who's using it and why they're using it. (Allied Health practitioner, Workshop 2) ‘Having a network of professionals who are have awareness, which is almost comes to marketing, but also we're talking about interprofessional exchange of information or making the tool readily shared between professionals. (GP practitioner, Workshop 2) ‘I would assume that if the tool was done, hopefully a copy would be sent to whoever the person the child was being referred to for further assessment and management.’ (GP practitioner, Workshop 4) ‘Making sure that there's some kind of structure in place so that the results are shared between relevant parties and also that you're not screening a child who's already had a screening or missing a child who says they've been screened but really hasn't been.’ (Allied Health practitioner, Workshop 4)

	‘Definitely for the screening that I do, screening where children are is much more effective than trying to get children in to be screened.’ (Allied Health practitioner, Workshop 4) ‘I also find it useful when families have the same tool reaffirmed in multiple contexts.’ (GP practitioner, Workshop 5) ‘Clear pathways, including a way to close the loop so that you can have any outcomes communicated back, which would be important if you're a GP or nurse practitioner.’ (Allied Health practitioner, Workshop 5) ‘I think it's important that the GP or paediatrician is involved and communicated with…so I'm thinking something along that lines that I was even as a dietitian, if I saw a child from or did a screening tool with this that those results are communicated back to their GP in some sort of loop cycle way’ (Allied Health practitioner, Workshop 5)
Community awareness	‘For the purpose and then advertising as well, like I know in that talk where we met like CAFS had those little exposure videos to say font. So you advertisement as well as interpretation compilation.’ (Allied Health practitioner, Workshop 1) ‘We also need the Community to know it exists and it might need a bit of marketing’ (GP practitioner, Workshop 2) ‘I often wish this for lots of things, not just children's health behaviours, that some of this might just be delivered direct to the public. It's such a waste of Medicare money for each of us practitioners to speak to families one on one and if it could be delivered in multiple contexts, I think that helps.’ (GP practitioner, Workshop 5)

	‘Whether there could be like a specific sticker or stamp or something that could be just associated just to increase awareness, but also that sense of keeping it at the forefront of the parent's mind.’ (Allied Health practitioner, Workshop 5) ‘I loved the concept of like they’re being a poster that say was in all the health professionals foyers with a QR code’ (Allied Health practitioner, Workshop 5) ‘It's all about awareness at first’ (Allied Health practitioner, Workshop 5)
Partnership with other services	‘The reality of putting this into place is whether when it comes to resources and referral pathways is just having outsourced or in partnership with other services like (Health) promotional with another service that has the same kind of motivation and benefits.’ (Child and Family Health nurse, Workshop 7)

Appendix 16: Pilot Study Reporting Checklist (CONSORT 2010 statement: extension to randomised pilot and feasibility trials [155])

Section/Topic	Item No	Checklist item	Thesis Section
Title and abstract			
	1a	Identification as a pilot or feasibility randomised trial in the title	7.1
	1b	Structured summary of pilot trial design, methods, results, and conclusions (for specific guidance see CONSORT abstract extension for pilot trials)	7.2
Introduction			
Background and objectives	2a	Scientific background and explanation of rationale for future definitive trial, and reasons for randomised pilot trial	7.3
	2b	Specific objectives or research questions for pilot trial	7.4
Methods			
Trial design	3a	Description of pilot trial design (such as parallel, factorial) including allocation ratio	7.5.1
	3b	Important changes to methods after pilot trial commencement (such as eligibility criteria), with reasons	N/A
Participants	4a	Eligibility criteria for participants	7.5.2

	4b	Settings and locations where the data were collected	7.5.4
	4c	How participants were identified and consented	7.5.5
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	7.5
Outcomes	6a	Completely defined prespecified assessments or measurements to address each pilot trial objective specified in 2b, including how and when they were assessed	7.5
	6b	Any changes to pilot trial assessments or measurements after the pilot trial commenced, with reasons	N/A
	6c	If applicable, prespecified criteria used to judge whether, or how, to proceed with future definitive trial	N/A
Sample size	7a	Rationale for numbers in the pilot trial	7.5.2
	7b	When applicable, explanation of any interim analyses and stopping guidelines	N/A
Randomisation:			
Sequence generation	8a	Method used to generate the random allocation sequence	N/A
	8b	Type of randomisation(s); details of any restriction (such as blocking and block size)	N/A
Allocation concealment	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	N/A

mechanism			
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	N/A
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	N/A
	11b	If relevant, description of the similarity of interventions	N/A
Statistical methods	12	Methods used to address each pilot trial objective whether qualitative or quantitative	7.5.10
Results			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were approached and/or assessed for eligibility, randomly assigned, received intended treatment, and were assessed for each objective	7.6.1
	13b	For each group, losses and exclusions after randomisation, together with reasons	7.6.1
Recruitment	14a	Dates defining the periods of recruitment and follow-up	7.6.1
	14b	Why the pilot trial ended or was stopped	7.6.1
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	7.6.1
Numbers analysed	16	For each objective, number of participants (denominator) included in each analysis. If relevant, these numbers should be by randomised group	0 & 7.6.3

Outcomes and estimation	17	For each objective, results including expressions of uncertainty (such as 95% confidence interval) for any estimates. If relevant, these results should be by randomised group	0 & 7.6.3
Ancillary analyses	18	Results of any other analyses performed that could be used to inform the future definitive trial	0 & 7.6.3
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	N/A
	19a	If relevant, other important unintended consequences	N/A
Discussion			
Limitations	20	Pilot trial limitations, addressing sources of potential bias and remaining uncertainty about feasibility	7.7.1
Generalisability	21	Generalisability (applicability) of pilot trial methods and findings to future definitive trial and other studies	7.7.2
Interpretation	22	Interpretation consistent with pilot trial objectives and findings, balancing potential benefits and harms, and considering other relevant evidence	7.7
	22a	Implications for progression from pilot to future definitive trial, including any proposed amendments	7.7.2
Other information			
Registration	23	Registration number for pilot trial and name of trial registry	N/A
Protocol	24	Where the pilot trial protocol can be accessed, if available	N/A

Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	N/A
	26	Ethical approval or approval by research review committee, confirmed with reference number	Appendix 17

Appendix 17: Pilot Study Flinders Ethics Approval

HUMAN ETHICS LOW RISK PANEL

APPROVAL NOTICE

Dear Ms Dimity Dutch,

The below proposed project has been **approved** on the basis of the information contained in the application and its attachments.

Project No:

7220

Project Title:

Health Behaviour Screening in the early years (0-5 years) - A mixed-methods acceptability study at Health2Go

Chief Investigator:

Ms Dimity Dutch

Approval Date: 15/05/2024

Expiry Date: 31/10/2024

Approved Co-Investigator/s:

Dr Sarah Hunter, Dr Lucinda Bell, Professor Elizabeth Denney-Wilson, Professor Rebecca Golley

Supervisory Panel:

Dr Sarah Hunter, Dr Lucinda Bell, Professor Elizabeth Denney-Wilson, Professor Rebecca Golley

Appendix 18: Pilot Study Recruitment Flyer

Appendix 19: Pilot Study Participant Information Sheet

Flinders University

PARTICIPANT INFORMATION SHEET

Title: Health Behaviour Screening in the early years (0-5 years) - A mixed-methods acceptability study at Health2Go

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Flinders University

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Description of the study
This research will engage caregivers of young children attending Health2Go, to understand their acceptability of child health behaviour screening in primary health care. Caregivers will be asked to complete an electronic child health behaviour screening tool and provide feedback via an electronic questionnaire to understand their acceptability and perspectives of the tool. This project is supported by Flinders University, College of Nursing and Health Sciences.

Purpose of the study
This project aims to understand caregiver views and acceptability of child health behaviour screening in primary health care.

Benefits of the study
The sharing of your experiences will help to provide valuable contribution to the scientific knowledge in this area, as child health behaviour screening in primary health care has not been explored in Australia. This study will inform the refinement of child health behaviour screening in primary health care as a strategy to support children's growth, health, and development in the early years. This study will provide crucial evidence of stakeholder acceptability to inform a larger scale hybrid implementation-effectiveness trial of child health behaviour screening in primary health care.

Participant involvement and potential risks
If you agree to participate in the research study, you will be asked to:

- complete an online questionnaire about what your child eats, how they are active, their sleep and screen use
- answer questions about your perspectives of the questionnaire, and of child health behaviour screening

Participating is entirely voluntary and there will be no consequences for choosing not to participate. The researchers do not expect the questions to cause any harm or discomfort to you. However, if you experience feelings of distress as a result of participation in this study, please let the research team know immediately. You can also contact the following services for support:

- Lifeline – 13 11 14, www.lifeline.org.au
- Beyond Blue – 1300 22 4636, www.beyondblue.org.au

Withdrawal Rights
You may decline to take part in this research study. If you decide to take part and later change your mind, you may withdraw at any time without providing an explanation. To withdraw, please contact the Chief Investigator to have your data removed from the study or you may just refuse to answer any questions, close the internet browser and leave the online questionnaire. Any data collected up to the point of your withdrawal will be securely destroyed.

Confidentiality and Privacy
Only researchers listed on this form have access to the individual information provided by you. Researchers will take all possible steps to ensure privacy and confidentiality will be adhered to at all times.

The research outcomes may be presented at conferences, written up for publication or used for other research purposes as described in this information form. You will not be named, and your individual information will not be identifiable in any research products without your explicit consent.
No data, including identifiable, non-identifiable and de-identified datasets, will be shared or used in future research projects without your explicit consent.

Data Storage
The information collected will be stored securely on a password protected computer and/or Flinders University server throughout the study. Any identifiable data will be de-identified for data storage purposes unless indicated otherwise. All data will be securely transferred to and stored at Flinders University for five years after publication of the results. Following the required data storage period, all data will be securely destroyed according to university protocols.

How will I receive feedback?
On project completion, a short summary of the outcomes will be presented via a poster that can be displayed in the Health2Go Clinic.

Ethics Committee Approval
The project has been approved by Flinders University's Human Research Ethics Committee (HREC project number 7220).

Queries and Concerns
Queries or concerns regarding the research can be directed to the research team. If you have any complaints or reservations about the ethical conduct of this study, you may contact the Flinders University's Research Ethics and Compliance Office team either via telephone (08) 8201 2543 or by emailing the Office via human.researchethics@flinders.edu.au.

Thank you for taking the time to read this information sheet.

By completing/submitting this survey, you are consenting to participate in this study and to the conditions outlined in the Participant Information Form.

Appendix 20: Pilot Study Demographic and Consent Form

This project aims to understand caregiver views and acceptability of child health behaviour screening in primary health care

If you agree to participate in this project, you will be asked to:

- complete an online questionnaire about what your child eats, how they are active, their sleep and screen use.
- answer questions about your perspectives of the questionnaire and of child health behaviour screening

Participation is entirely voluntary and there will be no consequences for choosing not to participate.

Please see the ***Participant Information Sheet*** below.
By completing this questionnaire, you are consenting to participate in this project and to the conditions outlined in the Participant Information Sheet.

This project is approved by Flinders Human Research Ethics Committee (Project ID 7220)

epoch – Translate
Translating Early Prevention of Obesity in Childhood

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Caregiver Demographic Questionnaire

Please answer the following questions to help us understand you and your child attending the clinic better. If you have multiple children attending the clinic, please keep *one child in mind* to answer the questions.

1. What is your relationship to the child attending the clinic?
    a. Mother
    b. Father
    c. Other caregiver
2. What is your current age in years? _____
3. What gender do you identify as?
    a. Woman
    b. Man
    c. Non-binary/third gender
    d. Prefer not to answer
4. What is your highest level of education?
    a. Did not complete high school
    b. Completed high school
    c. Some tertiary education (University or TAFE)
    d. Completed tertiary education (degree, diploma, certification)
    e. Higher degree (Masters, PhD)
    f. Prefer not to answer
5. What is your current employment status?
    a. Employed full-time (38+ hours per week)
    b. Employed part-time (up to 38 hours per week)
    c. Employed casually
    d. Not currently employed outside of the home
    e. Student
    f. Retired
    g. Prefer not to answer
6. What is your postcode? _____
7. How old is your child?
    a. 0 – 3 months
    b. 4 – 11 months
    c. 12 – 23 months
    d. 2 years

e. 3 years
f. 4 years
g. 5 years

8. What gender does your child identify as?
    a. Girl
    b. Boy
    c. Non-binary/third gender
    d. Prefer not to answer

Appendix 21: Pilot Study Pre-acceptability questionnaire

Health behaviour screening is an opportunity to think about what your child eats, how they are active, their sleep patterns, and screen use. By doing this, it might help identify conversations you might find useful raising with your health professional.

We are interested to know your views on child health behaviour screening in primary health care. Please answer each of the following questions/statements by selecting the option that reflects your response.

1. How **comfortable** would you feel completing a questionnaire on your child's health behaviours?

Very uncomfortable	Uncomfortable	No opinion	Comfortable	Very comfortable
1	**2**	**3**	**4**	**5**

2. How **confident** would you feel completing a questionnaire on your child's health behaviours?

Very unconfident	Unconfident	No opinion	Confident	Very confident
1	**2**	**3**	**4**	**5**

3. Did you think child health behaviour screening is well suited to primary health care?

Not suited at all	Not well suited	No opinion	Well suited	Very well suited
1	**2**	**3**	**4**	**5**

4. I would be willing to regularly monitor my child's health behaviours with my primary health care practitioner

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	**2**	**3**	**4**	**5**

5. How often would you be willing to monitor your child's health behaviours with your primary health care practitioner?
    a. During routine child health checks
    b. Annually
    c. Opportunistically
    d. Never
    e. Not sure
6. Health behaviour screening tool will **help inform individualised health behaviour focused conversations** about my child with my primary health care practitioners.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	**2**	**3**	**4**	**5**

7. How **comfortable** would you feel discussing your child's health behaviours with a primary health care practitioner after screening your child's health behaviours?

Very uncomfortable	Uncomfortable	No opinion	Comfortable	Very comfortable
1	**2**	**3**	**4**	**5**

8. How **confident** would you feel discussing your child's health behaviours with a primary health care practitioner after screening your child's health behaviours?

Very unconfident	Unconfident	No opinion	Confident	Very confident
1	**2**	**3**	**4**	**5**

Appendix 22: Child Health Behaviour Screening Tool (6-12 months)

Child Health Behaviour Screening Tool_0-12months

The Child Health Behaviour Screening Tool is an opportunity to think about what your child eats, how they are active, their sleep and screen use. By doing this, it may help identify conversations you might find useful to raise with your health professional.

If you would like your results sent to you, please provide your email at the end of the survey.

This first section asks questions about your child's eating and drinking.

How often does your child eat wholegrain or wholemeal bread (including rye, multi-grain, spelt)? (Please select one response only)	◯ Always ◯ Most of the time ◯ Sometimes ◯ My child eats white bread ◯ My child eats high fibre white bread ◯ My child doesn't eat bread
In the past 7 days, how many times per day did your child eat vegetables? (Please select one response only)	◯ 0 ◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 or more
From the list below, tick all the vegetables that your child has eaten over the past 7 days. Include fresh, cooked, frozen and canned vegetables. (Please select all that apply)	☐ Potato (baked or boiled, not fried) ☐ Pumpkin ☐ Cauliflower ☐ Peas or beans ☐ Mushroom ☐ Carrot ☐ Broccoli ☐ Corn, baby corn ☐ Legumes (i.e. chickpeas, lentils, kidney beans) ☐ Tomato ☐ Capsicum ☐ Zucchini ☐ Sweet Potato ☐ Spinach, baby spinach & other leafy greens ☐ Cucumber ☐ Avocado ☐ Vegetables in mixed dishes (e.g. soups & stews) ☐ Mixed frozen vegetables ☐ Other (e.g. garlic, onions) ☐ None of the above

In the past 7 days, has your child had the following:	Yes	No
100% fruit juice (including if diluted with water)	○	○
Fruit drinks (i.e. fruit box), cordial or soft drinks (including diet soft drinks and if diluted with water)	○	○
Flavoured milk	○	○
Chocolate (include all types of chocolate)	○	○
Potato crisps or savoury biscuits (including pretzels, rice crackers, Jatz, Shapes, corn chips)	○	○
Ice cream and ice blocks (not including homemade fruit blocks or yoghurt ice cream made from fruit and yoghurt)	○	○
Fried hot potato products such as hot chips, French fries, wedges, hash browns, potato gems (including those made at home)	○	○
Pizza (including from a takeaway shop, café, restaurant or frozen pizza. Not including homemade)	○	○
Processed meat (including ham, salami, sausages, hot dogs, frankfurters, fritz/devon, hamburgers, chicken nuggets)	○	○
Sweet biscuits, cakes, muffins, buns, donuts (including both homemade and purchased)	○	○

Is there anything that you think is relevant that you'd like to share about your child's eating?

Thank you for providing information about your child's eating and drinking.
This next section is about your child's movement.

Does your child walk?	◯ Yes ◯ No
Thinking about the past week, on a TYPICAL DAY, how many times did you place your child in a baby carrier or sling, car seat or capsule, stroller or pram, highchair, bouncer, jolly jumper or play pen?	◯ 0 ◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10
When your child was in one of those devices, how long were they usually in it?	◯ Less than 15 min ◯ Between 15 and 30 min ◯ Between 30 and 45 min ◯ Between 45 and 60 min ◯ Between 1 and 1.5 hrs ◯ Between 1.5 and 2 hrs ◯ More than 2 hrs per day
Does your child roll?	◯ Yes ◯ No
This question is about the times when your child is awake and placed on their tummy for playtime while you are watching them. Thinking about the past week, how many times EACH DAY did you usually place your child on their tummy for play?	◯ 0 ◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10
How long did each tummy time usually last?	◯ Less than 5 min ◯ 5 - 10 min ◯ 11 - 15 min ◯ 16 - 20 min ◯ 21 - 25 min ◯ 26 - 30 min ◯ More than 30 min
Thinking about the past week, on a TYPICAL DAY, how much time in total did you do some active play with your child? Active play could be crawling on the floor with your child, rolling around the floor with your child, playing at the park, dancing with your child, chasing your child.	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day

Thinking about the past week, on a TYPICAL WEEKDAY, how much time did your child spend in active play? Active play includes activities such as walking, running, dancing, climbing, playing with balls, riding bikes or scooters, or swimming.	◯ 0 min per day ◯ Between 1 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ Between 3 and 4 hrs per day ◯ More than 4 hrs per day
Of this time, how much was spent doing vigorous activities such as running, jumping, dancing, riding bikes or scooters?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day
Thinking about the past week, on a TYPICAL WEEKEND DAY, how much time did your child spend in active play? Active play includes activities such as walking, running, dancing, climbing, playing with balls, riding bikes or scooters, or swimming.	◯ 0 min per day ◯ Between 1 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ Between 3 and 4 hrs per day ◯ More than 4 hrs per day
Of this time, how much was spent doing vigorous activities such as running, jumping, dancing, riding bikes or scooters?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day

Is there anything that you think is relevant that you'd like to share about your child's movement?

Thank you for providing information about your child's movement.

This next section is about your child's screen time.

Thinking about the past week, on a TYPICAL DAY, how much time did your child spend watching television programs, videos/internet clips or movies on a television, computer or portable/mobile device such as iPad, tablet or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day
Thinking about the past week, on a TYPICAL DAY, how much time did your child spend playing games, looking at photos, or video chatting (e.g. FaceTime, Zoom, Skype) on a screen-based device such as a computer or laptop, video game console, iPad, tablet, or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day
Thinking about the past week, on a TYPICAL WEEKDAY, how much time did your child spend watching television programs, videos/internet clips or movies on a television, computer or portable/mobile device such as iPad, tablet or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ More than 3 hrs per day
Thinking about the past week, on a TYPICAL WEEKDAY, how much time did your child spend playing games, looking at photos, or video chatting (e.g. FaceTime, Zoom, Skype) on a screen-based device such as a computer or laptop, video game console, iPad, tablet, or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ Between 2 and 3hrs per day ◯ More than 3 hrs per day
Thinking about the past week, on a TYPICAL WEEKEND DAY, how much time did your child spend watching television programs, videos/internet clips or movies on a television, computer or portable/mobile device such as iPad, tablet or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ More than 3 hrs per day
Thinking about the past week, on a TYPICAL WEEKEND DAY, how much time did your child spend playing games, looking at photos, or video chatting (e.g. FaceTime, Zoom, Skype) on a screen-based device such as a computer or laptop, video game console, iPad, tablet, or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ Between 2 and 3hrs per day ◯ More than 3 hrs per day

Is there anything that you think is relevant that you'd like to share about your child's screen time?

Thank you for providing information about your child's screen time.

This final section is about your child's sleep.

Thinking about the past week, on a TYPICAL NIGHT, how much time did your child sleep in total during the night?	◯ Less than 6 hrs per night ◯ Between 6 and 8 hrs per night ◯ Between 8 and 10 hrs per night ◯ Between 10 and 12 hrs per night ◯ Between 12 and 14 hrs per night ◯ More than 14 hrs per night
Thinking about the past week, on a TYPICAL DAY, how much time did your child sleep in total during the day?	◯ Less than 1 hr per day ◯ Between 1 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ Between 3 and 4 hrs per day ◯ More than 4 hrs per day
In a TYPICAL WEEK, how often does your child have a regular bedtime routine (e.g., bath, story)?	◯ Never ◯ 1 - 2 nights per week ◯ 3 - 4 nights per week ◯ 5 - 6 nights per week ◯ Every night

Is there anything that you think is relevant that you'd like to share about your child's sleeping?

Appendix 23: Child Health Behaviour Screening Tool (1-5 years)

Child Health Behaviour Screening Tool_1-5 years

The Child Health Behaviour Screening Tool is an opportunity to think about what your child eats, how they are active, their sleep and screen use. By doing this, it may help identify conversations you might find useful to raise with your health professional.

If you would like your results sent to you, please provide your email at the end of the survey.

This first section asks questions about your child's eating and drinking.

How often does your child eat wholegrain or wholemeal bread (including rye, multi-grain, spelt)? (Please select one response only)	◯ Always ◯ Most of the time ◯ Sometimes ◯ My child eats white bread ◯ My child eats high fibre white bread ◯ My child doesn't eat bread
What type of milk does your child drink most of the time? (Please select one response only)	◯ My child does not drink milk ◯ Whole (full-cream/regular) ◯ Skim ◯ Low/reduced fat ◯ Soy ◯ Other (i.e. almond milk, coconut milk)
In the past 7 days, how many times per day did your child eat vegetables? (Please select one response only)	◯ 0 ◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 or more

From the list below, tick all the vegetables that your child has eaten over the past 7 days. Include fresh, cooked, frozen and canned vegetables.

(Please select all that apply)

- ☐ Potato (baked or boiled, not fried)
- ☐ Pumpkin
- ☐ Cauliflower
- ☐ Peas, beans, snow peas, snap peas
- ☐ Lettuce
- ☐ Mushroom
- ☐ Tomato
- ☐ Capsicum
- ☐ Zucchini
- ☐ Cabbage
- ☐ Brussel Sprouts
- ☐ Sweet Potato
- ☐ Spinach, baby spinach, rocket & other leafy greens
- ☐ Cucumber
- ☐ Celery
- ☐ Eggplant
- ☐ Carrot
- ☐ Broccoli
- ☐ Corn, baby corn
- ☐ Legumes (i.e. chickpeas, lentils, kidney beans)
- ☐ Asian greens (i.e. bok choy)
- ☐ Avocado
- ☐ Asparagus
- ☐ Vegetables in mixed dishes (e.g. soups & stews)
- ☐ Mixed frozen vegetables
- ☐ Other (e.g. olives, onions, beetroot, radish)
- ☐ None of the above

In the past 7 days, how many times has your child had the following:	0	1	2	3	4	5	6	Every day	8+ (more than once per day)
Fruit juice (including 100% fruit juice), fruit drinks (i.e. fruit box), cordial or soft drinks (including diet soft drinks). Include diluted versions.	○	○	○	○	○	○	○	○	○
Flavoured milk	○	○	○	○	○	○	○	○	○
Chocolate (include all types of chocolate)	○	○	○	○	○	○	○	○	○
Potato crisps or savoury biscuits (including pretzels, rice crackers, Jatz, corn chips)	○	○	○	○	○	○	○	○	○
Ice cream and ice blocks (not homemade from fruit and yoghurt)	○	○	○	○	○	○	○	○	○
Fried hot potato products such as hot chips, french fries, wedges, hash browns, potato gems (including those made at home)	○	○	○	○	○	○	○	○	○
Pizza (including from a takeaway shop, cafe, restaurant or frozen pizza. Not including homemade)	○	○	○	○	○	○	○	○	○
Processed meat (including ham, salami, sausages, hot dogs, frankfurters, fritz/devon, hamburgers, chicken nuggets)	○	○	○	○	○	○	○	○	○
Sweet biscuits, cakes, muffins, buns, donuts (including both homemade and purchased)	○	○	○	○	○	○	○	○	○

Is there anything that you think is relevant that you'd like to share about your child's eating?

Thank you for providing information about your child's eating and drinking.
This next section is about your child's movement.

Does your child walk?	◯ Yes ◯ No
Thinking about the past week, on a TYPICAL DAY, how many times did you place your child in a baby carrier or sling, car seat or capsule, stroller or pram, highchair, bouncer, jolly jumper or play pen?	◯ 0 ◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10
When your child was in one of those devices, how long were they usually in it?	◯ Less than 15 min ◯ Between 15 and 30 min ◯ Between 30 and 45 min ◯ Between 45 and 60 min ◯ Between 1 and 1.5 hrs ◯ Between 1.5 and 2 hrs ◯ More than 2 hrs per day
Does your child roll?	◯ Yes ◯ No
This question is about the times when your child is awake and placed on their tummy for playtime while you are watching them. Thinking about the past week, how many times EACH DAY did you usually place your child on their tummy for play?	◯ 0 ◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6 ◯ 7 ◯ 8 ◯ 9 ◯ 10
How long did each tummy time usually last?	◯ Less than 5 min ◯ 5 - 10 min ◯ 11 - 15 min ◯ 16 - 20 min ◯ 21 - 25 min ◯ 26 - 30 min ◯ More than 30 min
Thinking about the past week, on a TYPICAL DAY, how much time in total did you do some active play with your child? Active play could be crawling on the floor with your child, rolling around the floor with your child, playing at the park, dancing with your child, chasing your child.	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day

Thinking about the past week, on a TYPICAL WEEKDAY, how much time did your child spend in active play? Active play includes activities such as walking, running, dancing, climbing, playing with balls, riding bikes or scooters, or swimming.	◯ 0 min per day ◯ Between 1 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ Between 3 and 4 hrs per day ◯ More than 4 hrs per day
Of this time, how much was spent doing vigorous activities such as running, jumping, dancing, riding bikes or scooters?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day
Thinking about the past week, on a TYPICAL WEEKEND DAY, how much time did your child spend in active play? Active play includes activities such as walking, running, dancing, climbing, playing with balls, riding bikes or scooters, or swimming.	◯ 0 min per day ◯ Between 1 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ Between 3 and 4 hrs per day ◯ More than 4 hrs per day
Of this time, how much was spent doing vigorous activities such as running, jumping, dancing, riding bikes or scooters?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day

Is there anything that you think is relevant that you'd like to share about your child's movement?

Thank you for providing information about your child's movement.

This next section is about your child's screen time.

Thinking about the past week, on a TYPICAL DAY, how much time did your child spend watching television programs, videos/internet clips or movies on a television, computer or portable/mobile device such as iPad, tablet or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day
Thinking about the past week, on a TYPICAL DAY, how much time did your child spend playing games, looking at photos, or video chatting (e.g. FaceTime, Zoom, Skype) on a screen-based device such as a computer or laptop, video game console, iPad, tablet, or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ More than 2 hrs per day
Thinking about the past week, on a TYPICAL WEEKDAY, how much time did your child spend watching television programs, videos/internet clips or movies on a television, computer or portable/mobile device such as iPad, tablet or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ More than 3 hrs per day
Thinking about the past week, on a TYPICAL WEEKDAY, how much time did your child spend playing games, looking at photos, or video chatting (e.g. FaceTime, Zoom, Skype) on a screen-based device such as a computer or laptop, video game console, iPad, tablet, or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ Between 2 and 3hrs per day ◯ More than 3 hrs per day
Thinking about the past week, on a TYPICAL WEEKEND DAY, how much time did your child spend watching television programs, videos/internet clips or movies on a television, computer or portable/mobile device such as iPad, tablet or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ More than 3 hrs per day
Thinking about the past week, on a TYPICAL WEEKEND DAY, how much time did your child spend playing games, looking at photos, or video chatting (e.g. FaceTime, Zoom, Skype) on a screen-based device such as a computer or laptop, video game console, iPad, tablet, or smartphone?	◯ 0 min per day ◯ Between 1 and 15 min per day ◯ Between 15 and 30 min per day ◯ Between 30 and 60 min per day ◯ Between 1 and 1.5 hrs per day ◯ Between 1.5 and 2 hrs per day ◯ Between 2 and 3hrs per day ◯ More than 3 hrs per day

Is there anything that you think is relevant that you'd like to share about your child's screen time?

Thank you for providing information about your child's screen time.

This last section is about your child's sleep.

Thinking about the past week, on a TYPICAL NIGHT, how much time did your child sleep in total during the night?	◯ Less than 6 hrs per night ◯ Between 6 and 8 hrs per night ◯ Between 8 and 10 hrs per night ◯ Between 10 and 12 hrs per night ◯ Between 12 and 14 hrs per night ◯ More than 14 hrs per night
Thinking about the past week, on a TYPICAL DAY, how much time did your child sleep in total during the day?	◯ Less than 1 hr per day ◯ Between 1 and 2 hrs per day ◯ Between 2 and 3 hrs per day ◯ Between 3 and 4 hrs per day ◯ More than 4 hrs per day
In a TYPICAL WEEK, how often does your child have a regular bedtime routine (e.g., bath, story)?	◯ Never ◯ 1 - 2 nights per week ◯ 3 - 4 nights per week ◯ 5 - 6 nights per week ◯ Every night

Is there anything that you think is relevant that you'd like to share about your child's sleep?

Appendix 24: Pilot Study Post-acceptability questionnaire

Thank you for completing the Child Health Behaviour Screening Tool! We are interested to know your views on the child health behaviour screening tool you just completed. Please answer each of the following questions/statements by selecting the option that reflects your response.

1. Did you **like** the child health behaviour screening tool?

Strongly dislike	Dislike	No opinion	Like	Strongly like
1	**2**	**3**	**4**	**5**

2. How **comfortable** did you feel completing the child health behaviour screening tool?

Very uncomfortable	Uncomfortable	No opinion	Comfortable	Very comfortable
1	**2**	**3**	**4**	**5**

3. How **confident** did you feel completing the child health behaviour screening tool?

Very unconfident	Unconfident	No opinion	Confident	Very confident
1	**2**	**3**	**4**	**5**

4. How **easy** was the child health behaviour screening tool to complete?

Very difficult	Difficult	No opinion	Easy	Very easy
1	**2**	**3**	**4**	**5**

5. The tool questions were **clear and easy to understand**.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	**2**	**3**	**4**	**5**

6. The amount of time to complete the screening tool was **suitable**.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	**2**	**3**	**4**	**5**

7. Did you think the child health behaviour screening tool is well suited to primary health care?

Not suited at all	Not well suited	No opinion	Well suited	Very well suited
1	**2**	**3**	**4**	**5**

8. The child health behaviour screening tool will **help inform health behaviour focused conversations** about my child with my primary health care practitioner.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	**2**	**3**	**4**	**5**

9. How **comfortable** would you feel discussing your child's health behaviours with a primary health care practitioner after completing the child health behaviour screening tool?

Very uncomfortable	Uncomfortable	No opinion	Comfortable	Very comfortable
1	**2**	**3**	**4**	**5**

10. How **confident** would you feel discussing your child's health behaviours with a primary health care practitioner after completing the child health behaviour screening tool?

Very unconfident	Unconfident	No opinion	Confident	Very confident
1	**2**	**3**	**4**	**5**

11. Throughout this project, we have used the term 'Child Health Behaviour' screening. This is just one potential name for this approach. We would love to know what terms you find appropriate (tick as many options as you like)
    a. Child Health Behaviour Screening
    b. Healthy Habits Screening
    c. Lifestyle Screening
    d. Diet, Movement and Sleep Screening
    e. Health and Development Screening
    f. Other

If you selected 'Other', please enter any other suggestions you have for what this approach could be called:

[Open text response option]

12. If you were to receive the results of the screening tool, what would you like to receive? (tick as many options as you like)
    a. I would not like to receive the results
    b. I would like my health care practitioner to receive the results
    c. I would like to receive a high-level summary of the results
    d. I would like to receive the specific results for each question
    e. I would like to receive a high-level summary of the results compared to guidelines/recommendations
    f. I would like to receive a specific results compared to guidelines/recommendations
    g. I would like to receive a visual summary of the results (e.g. pie chart)
    h. I would like to receive a visual summary of the results compared to guidelines/recommendations (e.g. traffic light system)
    i. Other

If you selected ‘Other’, please expand in the free text box below:

[Open text response option]

13. Finally, we would love to know your views on the resources and supports you might need after completing a survey on your child's health behaviours? (tick as many options as you like)
    a. Educational resources on national recommendations for child health behaviours
    b. Educational resources on how to have health behaviour conversations with your practitioner
    c. Referrals to services and organisations to support your child's health behaviours
    d. Links to trusted websites and organisations to access further information and support
    e. None of the above
    f. Other

If you selected ‘Other’, please expand in the free text box below:

[Open text response option]

Thank you for answering questions about your perspectives on child health behaviour screening.

Appendix 25: Pilot Study EOI to participate in interview

We would love to hear more about your feedback on child health behaviour screening through a virtual focus group or interview.

If you are interested in participating in a focus group, please provide your contact details and preferred days and times below and we will contact you to organise a suitable time to chat.

Are you interested in participating in a virtual focus group or interview?

- Yes
- No

If Yes:

Please provide your full name: _____

How would you like to be contacted to organise a focus group or interview?

- Email
- Phone

Preferred email address: _____

Preferred phone number: _____

Preferred day to attend a focus group or interview?

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

Preferred time to meet for a focus group or interview?

- Morning (between 8am and 12pm)
- Afternoon (between 12pm and 5pm)
- Evening (between 5pm and 8pm)

Any other comments to provide regarding your interest or availability to attend a focus group or interview?

_____
_____
_____
_____
_____

If No:

Thank you for completing our survey about child health behaviour screening. Your input is greatly appreciated!

Appendix 26: Pilot Study Semi-structured Interview Guide

Introduction to Focus Group/Interview

Thank you all for agreeing to participate in the focus group/interview today. Reminder that today's focus group/interview will be recorded for research purposes

Gain verbal consent from all participants prior to recording

In today's focus group/interview I am hoping to get a better understanding of your perspectives on child health behaviour screening in primary health care.

The focus group/interview will go for around an hour. If you need to take a break or leave the focus group/interview at any time, that is no problem at all, just let me know.

As a reminder, I asked a series of questions on an iPad asking about your child's eating, movement, screen time and sleep. There were questions asking you to reflect on your child's behaviours over the last 7 days or on a typical day, there were also prompts for your to share anything else that was relevant about your child's eating, movement, screen time and sleep.

Firstly, I would love to know why were you interested in coming along today?

<u>Caregiver views on child health behaviour screening</u>

- Do you think health behaviour screening is a useful and helpful strategy to monitor child health behaviours? Why? Why not?
- Thoughts on the approach in general practice, paediatric clinic outside of Health2GO.

<u>Caregiver views on the child health behaviour screening tool</u>

- Think about the child health behaviour screening tool that you completed at Health2Go. What did you think about the tool?
- Was there anything you didn't like about the tool? (Content vs Function vs Layout)
- Do you have any suggestions to improve the tool?
- What aspects of the tool were helpful?

<u>Caregiver views on initiating a health behaviour focused conversation with their practitioner</u>

Current practice in primary health care is to measure and record child length/height and weight, and plot these on age- and sex-specific growth monitoring charts.

Initiating a health behaviour focused conversation example

- How do you feel about initiating a health behaviour focused conversation with your practitioner?
- Do you think this would be different following growth monitoring?
- Do you think this would be different following health behaviour screening?

Are other's peoples experiences different/similar

Perspectives on the name of the tool

After completing the screening tool there were then a few questions about your perspectives on the tool's name. Throughout this project, we have used the term "Child Health Behaviour" screening, however this is just one potential name for the approach.

Other names we suggested included:

- Healthy Habits screening
- Lifestyle screening
- Diet, movement and sleep screening
- Health and Development screening

Does anyone have any comments on their preference for the tool name or any other suggestions for the name of the tool?

Caregiver views on resources and support needed following child health behaviour screening

- Would you like to receive the results? Why? Why not?
- I would not like to receive the results
- I would like my practitioner to receive the results
- I would like to receive a high-level summary of the results
- I would like to receive specific results for each question
- I would like to receive a high-level summary of results compared to guidelines/recommendations
- I would like to receive specific results compared to guidelines/recommendations
- I would like to receive a visual summary of the results
- I would like to receive a visual summary of the results compared to guidelines/recommendations

What types of resources or supports would you like after completing the screening tool?

- Educational resources of national recommendations
- Educational resources on how to have conversations with your practitioner
- Referrals to services and organisations to support your child's health behaviours
- Links to trusted websites and organisations for further information and support

Did you access any of the resources provided (INFANT/Healthy Beginnings)

Closing focus group/Interview

Thank you all for sharing your experiences and perspectives with me today. Does anyone have any other thoughts you'd like to add before we finish up?

In recognition of your contribution in today's focus group/interview, I will email you all a $30 Prezee vouchers which can be used anywhere.