

The discordance between policy and  
practice in the dietary management of  
diabetes in residential aged care:  
A mixed methods study

By,

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# TABLE OF CONTENTS

<b>TABLE OF CONTENTS</b> .....	<b>I</b>
<b>LIST OF TABLES</b> .....	<b>VI</b>
<b>LIST OF FIGURES</b> .....	<b>VIII</b>
<b>SUMMARY</b> .....	<b>IX</b>
<b>DECLARATION</b> .....	<b>XI</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>XII</b>
<b>PUBLICATIONS ARISING FROM THIS RESEARCH</b> .....	<b>XIV</b>
PEER REVIEWED MANUSCRIPTS .....	XIV
INVITED ARTICLES .....	XIV
<b>CONFERENCE ABSTRACTS</b> .....	<b>XV</b>
ORAL PRESENTATIONS .....	XV
CONFERENCE ABSTRACTS - POSTERS .....	XV
<b>ABBREVIATIONS</b> .....	<b>XVI</b>
<b>CHAPTER ONE - INTRODUCTION</b> .....	<b>1</b>
1.1 RATIONALE .....	1
1.1.1 <i>Diabetes Mellitus</i> .....	4
1.1.2 <i>Pathophysiology of diabetes</i> .....	4
1.2 FOOD SERVICE SYSTEMS MODEL AS A FRAMEWORK.....	9
1.3 RESEARCH QUESTIONS.....	13
1.3.1 <i>Quantitative</i> .....	13
1.3.2 <i>Qualitative</i> .....	13
1.3.3 <i>Mixed methods</i> .....	13
1.4 RESEARCH OBJECTIVES.....	14
1.5 SUMMARY .....	15
<b>CHAPTER TWO – RESEARCH METHODOLOGY</b> .....	<b>17</b>
2.0 OVERVIEW .....	17
2.1 A PRAGMATIC APPROACH TO RESEARCH DESIGN .....	19
2.1.1 <i>Quantitative methods</i> .....	19
2.1.2 <i>Qualitative methods</i> .....	21
2.2 THE POSITION OF THE RESEARCHER .....	25

2.3 SUMMARY .....	26
<b>CHAPTER THREE - SYSTEMATIC REVIEW OF THE EVIDENCE FOR A LIBERALISED DIET IN THE MANAGEMENT OF DIABETES MELLITUS IN OLDER ADULTS RESIDING IN AGED CARE FACILITIES .....</b>	<b>28</b>
3.0 OVERVIEW .....	28
3.1 BACKGROUND .....	28
3.1.1 <i>Diagnosis of diabetes</i> .....	30
3.1.2 <i>Management of diabetes</i> .....	31
3.1.3 <i>Historical dietary management of diabetes</i> .....	33
3.1.4 <i>Changes in practice</i> .....	37
3.1.5 <i>The diet and diabetes controversy</i> .....	37
3.2 RESEARCH QUESTION .....	39
3.3 METHODS .....	39
3.4 RESULTS .....	41
3.4.1 <i>Effects of intervention on glycaemic management of diabetes</i> .....	44
3.4.2 <i>Effect of therapeutic diet on nutritional status</i> .....	47
3.4.3 <i>Effects of a therapeutic diet on comorbidity risk factors</i> .....	48
3.5 DISCUSSION .....	49
3.6 SUMMARY .....	49
<b>CHAPTER FOUR – A SCOPING REVIEW OF GUIDELINES REFERRING TO THE DIETARY MANAGEMENT OF DIABETES IN OLDER ADULTS IN RESIDENTIAL AGED CARE .....</b>	<b>50</b>
4.0 OVERVIEW .....	50
4.1 RESEARCH QUESTION .....	50
4.2 BACKGROUND .....	50
4.3 METHODS .....	52
4.3.1 <i>Data screening</i> .....	53
4.3.2 <i>Data extraction and quality appraisal</i> .....	53
4.4 RESULTS .....	53
4.4.1 <i>Key findings for diet recommendations</i> .....	60
4.5 DISCUSSION .....	62
4.6 SUMMARY .....	64
<b>CHAPTER FIVE - A WEB BASED SURVEY TO DETERMINE CURRENT PRACTICES IN AUSTRALIAN RESIDENTIAL AGED CARE .....</b>	<b>65</b>
5.0 OVERVIEW .....	65
5.1 RESEARCH QUESTION .....	65
5.2 BACKGROUND .....	66
5.3 METHODS .....	67

5.3.1 Questionnaire Structure .....	67
5.3.2 Data Analysis.....	68
5.4 RESULTS .....	68
5.4.1 Respondent Demographics.....	68
5.4.2 Food Service Management.....	70
5.4.3 The Menu .....	72
5.4.4 Therapeutic Diabetic Diet.....	72
5.5 DISCUSSION .....	78
5.6 SUMMARY .....	79

**CHAPTER SIX – A RETROSPECTIVE AUDIT EXAMINING THE RATIONALE FOR A LIBERALISED DIET FOR THE MANAGEMENT OF OLDER ADULTS WITH DIABETES IN RESIDENTIAL AGED CARE .....81**

6.0 OVERVIEW .....	81
6.1 RESEARCH QUESTION.....	82
6.2 BACKGROUND .....	82
6.3 METHODS.....	83
6.4 RESULTS.....	85
6.4.1 Clinical presentation of residents with diabetes.....	89
6.4.2 Generational differences.....	89
6.4.3 Therapeutic diet codes and malnutrition risk.....	91
6.5 DISCUSSION .....	93
6.6 SUMMARY .....	95

**CHAPTER SEVEN – EXPLORING FOOD SERVICE STAFF KNOWLEDGE AND PRACTICE IN THE DIETARY MANAGEMENT OF DIABETES IN RESIDENTIAL AGED CARE .....96**

7.0 OVERVIEW .....	96
7.1 RESEARCH QUESTION.....	96
7.2 BACKGROUND .....	97
7.3 METHODS.....	98
7.3.1 Focus groups.....	98
7.3.2 Participants .....	98
7.3.3 Recruitment.....	98
7.3.4 Data Collection .....	99
7.3.5 Data Analysis.....	101
7.4 RESULTS .....	101
7.4.1 Theming of focus groups.....	104
7.4.2 Theme 1 - Knowledge and Understanding .....	108
7.4.3 Theme 2 - Dietary management of Diabetes in practice.....	108
7.4.4 Theme 3 - The food service system.....	109

7.5 DISCUSSION .....	110
7.6 SUMMARY .....	112
<b>CHAPTER EIGHT – EXPLORING THE EXPERIENCE OF MEALTIMES FOR RESIDENTS WITH AND WITHOUT DIABETES IN RESIDENTIAL AGED CARE FACILITIES.....</b>	<b>114</b>
8.0 OVERVIEW .....	114
8.1 RESEARCH QUESTION.....	114
8.2 BACKGROUND .....	114
8.3 METHOD .....	115
8.3.1 <i>The Participants</i> .....	116
8.3.2 <i>Recruitment of the participants</i> .....	117
8.3.3 <i>Data collection</i> .....	117
8.3.4 <i>Data analysis</i> .....	117
8.4 RESULTS.....	118
8.4.1 <i>Overview of observation dining rooms</i> .....	120
8.4.2 <i>Observations</i> .....	125
8.4.3 <i>Observations which may negatively impact oral intake</i> .....	132
8.4.4 <i>Observations which may positively impact oral intake</i> .....	133
8.5 DISCUSSION .....	134
8.6 SUMMARY .....	137
<b>CHAPTER NINE – EXPLORING THE WANTS AND NEEDS OF OLDER ADULTS WITH DIABETES AND THEIR DIETARY MANAGEMENT ON TRANSITIONING INTO RESIDENTIAL AGED CARE.....</b>	<b>138</b>
9.0 OVERVIEW .....	138
9.1 RESEARCH QUESTION.....	139
9.2 BACKGROUND .....	139
9.3 METHODS.....	141
9.3.1 <i>Recruitment</i> .....	141
9.3.2 <i>Data Collection</i> .....	142
9.3.4 <i>Data Analysis</i> .....	145
9.4 RESULTS.....	145
9.4.1 <i>Characteristics of respondents</i> .....	145
9.4.2 <i>Focus Groups</i> .....	147
9.4.3 <i>Thematic analysis</i> .....	147
9.4.4 <i>Theme 1: Choice</i> .....	151
9.4.5 <i>Theme 2: Dietary Restriction</i> .....	151
9.4.6 <i>Theme 3: Food service System</i> .....	152
9.5 DISCUSSION .....	154
9.5.1 <i>Implications for practice</i> .....	156

9.6 SUMMARY .....	157
<b>CHAPTER TEN – SUMMARY AND CONCLUSION.....</b>	<b>158</b>
10.0 OVERVIEW .....	158
10.1 MIXED METHODS RESEARCH QUESTION.....	158
10.2 SUMMARY OF THIS RESEARCH .....	159
10.2.1 <i>The food service system</i> .....	160
10.2.2 <i>Health beliefs</i> .....	162
10.2.3 <i>Autonomy and Choice</i> .....	165
10.2.4 <i>Discordance in policy and practice</i> .....	168
10.3 STRENGTHS AND LIMITATIONS.....	170
10.4 CONCLUSIONS .....	171
10.5 IMPLICATIONS FOR PRACTICE .....	172
10.6 FUTURE RESEARCH.....	173
<b>REFERENCES .....</b>	<b>174</b>
<b>APPENDIX 1 – CARBOHYDRATE COUNTING (1970S – 1980S).....</b>	<b>186</b>
<b>APPENDIX 2 - CARBOHYDRATE EXCHANGES CURRENTLY USED IN LEVEL 1 AND 2 CARBOHYDRATE COUNTING EDUCATION .....</b>	<b>189</b>
<b>APPENDIX 3 – ADVANCED CARBOHYDRATE COUNTING (EXTRACT FROM LILLY™ PATIENT EDUCATION HAND OUT) .....</b>	<b>194</b>
<b>APPENDIX 4 - SYSTEMATIC LITERATURE REVIEW SEARCH STRATEGY .....</b>	<b>196</b>
<b>APPENDIX 5 - WEB SURVEY QUESTIONS FOR RAC FOOD SERVICE MANAGERS (ADMINISTERED ONLINE VIA SURVEY MONKEY).....</b>	<b>199</b>
<b>APPENDIX 6 - MEAL OBSERVATION FIELD NOTES.....</b>	<b>215</b>
MEAL OBSERVATION INFORMATION LETTER AND CONSENT FORM .....	218
<b>APPENDIX 7 – FOCUS GROUP INFORMATION SHEETS AND PROPOSED INTERVIEW GUIDE.....</b>	<b>222</b>
BABY BOOMER INFORMATION SHEET: .....	223
BABY BOOMER AND RESIDENT CONSENT FORM .....	225
RESIDENT INFORMATION SHEET: .....	227
PROPOSED FOCUS GROUP QUESTIONS: .....	229
<b>APPENDIX 8 – FOCUS GROUP PARTICIPANT DEMOGRAPHIC INFORMATION QUESTIONS.....</b>	<b>230</b>
BABY BOOMER DEMOGRAPHIC INFORMATION:.....	231
RESIDENT DEMOGRAPHIC INFORMATION:.....	233

## LIST OF TABLES

TABLE 1- ANNUAL DIABETES RELATED HEALTH EXPENDITURE PER PERSON, IN AUSTRALIA.....	29
TABLE 2 – HISTORICAL PERSPECTIVE OF DIET RECOMMENDATIONS FOR MANAGEMENT OF DIABETES ADAPTED FROM THE <i>NUTRITION RECOMMENDATIONS AND PRINCIPLES OF CARE FOR PEOPLE WITH DIABETES MELLITUS</i> <sup>(85)</sup> .....	33
TABLE 3 – LIST OF KEYWORD AND MESH SEARCH TERMS .....	40
TABLE 4 - QUALITY ASSESSMENT OF STUDIES INCLUDED IN THE REVIEW ACCORDING TO THE JADAD SCALE <sup>(117)</sup> .....	41
TABLE 5 - SUMMARY OF STUDIES THAT EXAMINE A RELATIONSHIP BETWEEN DIET AND DIABETES MANAGEMENT, NUTRITIONAL STATUS AND COMORBIDITY RISK FACTOR OUTCOMES.....	43
TABLE 6 – STUDY METHODOLOGY AND KEY FINDINGS FOR STUDIES EVALUATING EFFECTS OF A LIBERALISED DIET ON GLYCAEMIA .....	46
TABLE 7 - LIST OF KEYWORD AND MESH SEARCH TERMS FOR A SCOPING REVIEW OF DIETARY GUIDELINES FOR THE MANAGEMENT OF OLDER ADULTS WITH DIABETES.....	52
TABLE 8 - OVERVIEW OF DIET SPECIFIC GUIDELINES FOR THE MANAGEMENT OF OLDER ADULTS WITH DIABETES .....	55
TABLE 9 - OVERVIEW OF GENERAL MANAGEMENT GUIDELINES FOR THE MANAGEMENT OF OLDER ADULTS WITH DIABETES AND KEY NUTRITION MESSAGES .....	56
TABLE 10 – TOTAL RESPONDENT DEMOGRAPHICS BY STATE AND TERRITORY AND N (%) FACILITIES STILL PROVIDING A THERAPEUTIC ‘DIABETIC’ DIET .....	69
TABLE 11 – COMPARISON OF KEY PERSONNEL INVOLVED IN MENU DEVELOPMENT AND DELIVERY IN AUSTRALIAN RESIDENTIAL AGED CARE (RAC) FOR THOSE RESPONDENTS STILL PROVIDING COMPARED TO THOSE NOT PROVIDING A ‘DIABETIC’ DIET.....	71
TABLE 12 – OVERVIEW OF TYPICAL FOOD RESTRICTIONS AND ADDITIONS THAT REPRESENT THE CURRENT ‘DIABETIC DIET’ AS COMPARED TO THE STANDARD MENU OFFERED TO ALL OTHER RESIDENTS IN AUSTRALIAN RESIDENTIAL AGED CARE (ONE WAY CHI SQUARED TEST) .....	74
TABLE 13- RESIDENTS’ WITH DIABETES AND THEIR CHARACTERISTICS, WITH SIGNIFICANCE BETWEEN AGE GROUPS DETERMINED VIA KRUSKAL-WALLIS OR X2 TEST .....	87
TABLE 14 – TYPICAL CHARACTERISTICS FOR RESIDENTS WITH DIABETES COMPARED TO MALNUTRITION RISK SCORE AND SIGNIFICANT DIFFERENCES BETWEEN GROUPS (P=<0.05) .....	90
TABLE 15 – HIERARCHAL LOGISTIC REGRESSION ANALYSIS IDENTIFYING VARIABLES THAT MAY PREDICT LIKELIHOOD OF RESIDENTS WITH DIABETES BEING AT RISK OF MALNUTRITION.....	92
TABLE 16 - TYPICAL CHARACTERISTICS OF FOCUS GROUP PARTICIPANTS .....	103
TABLE 17 - OVERVIEW OF KEY THEMES AND TOPICS GENERATED BY FOCUS GROUP DISCUSSION OF DIETARY APPROACHES FOR DIABETES MANAGEMENT IN OLDER ADULTS IN RAC .....	105
TABLE 18 - OVERVIEW OF MEAL TIMINGS, DURATION AND STAFFING BETWEEN OBSERVATION SITES.....	119
TABLE 19 – KEY THEMES AND EXEMPLAR OBSERVATIONS .....	127
TABLE 20 - OBSERVED EVENTS THAT MAY POSITIVELY INFLUENCE DIETARY INTAKE .....	131
TABLE 21- OBSERVED EVENTS THAT MAY NEGATIVELY INFLUENCE DIETARY INTAKE.....	132
TABLE 22- DEMOGRAPHIC CHARACTERISTICS OF FOCUS GROUP PARTICIPANTS – OLDER ADULTS WITH DIABETES	

LIVING IN THEIR OWN HOME COMPARED TO RESIDENTIAL AGED CARE ..... 146

TABLE 23 - KEY THEMES (N=3), TOPICS (N=13) AND EXEMPLAR QUOTES FROM COMMUNITY BASED OLDER ADULTS  
WITH DIABETES AS COMPARED TO OLDER ADULTS WITH DIABETES IN RESIDENTIAL AGED CARE..... 148



## LIST OF FIGURES

FIGURE 1 - AUSTRALIAN POPULATION STRUCTURE BY AGE AND SEX 1961 – 2011 .....	2
FIGURE 2 - OVERVIEW OF DIABETES PATHOLOGY AND CAUSES OF HYPERGLYCAEMIA <sup>(17)</sup> .....	7
FIGURE 3 - FOOD SERVICE SYSTEMS MODEL ADAPTED FROM ‘A MODEL FOR EVALUATING FOODSERVICE SYSTEM’, BY A.G. VADEN (1980) .....	10
FIGURE 4 - LENGYEL ET AL (2003) PROTEC FOOD SERVICE MODEL.....	11
FIGURE 5 - ADAPTED PROTEC FOOD SYSTEMS MODEL PROVIDING A FRAMEWORK FOR THE RESEARCH ENTITLED <i>THE DISCORDANCE BETWEEN POLICY AND PRACTICE IN THE DIETARY MANAGEMENT OF DIABETES IN RAC</i> .....	12
FIGURE 6 - SEQUENTIAL DESIGN OF STUDIES TO IDENTIFY THE DISCORDANCE BETWEEN POLICY AND PRACTICE IN THE DIETARY MANAGEMENT OF OLDER ADULTS WITH DIABETES .....	18
FIGURE 7 - GRAPHIC ILLUSTRATION OF THE AUSTRALIAN GUIDE TO HEALTHY EATING <sup>(84)</sup> .....	32
FIGURE 8 - AN OVERVIEW OF GLYCEMIC INDEX RANGES AND TYPICAL FOODS FOR LOW, MODERATE AND HIGH GI FOODS <sup>(90)</sup> .....	35
FIGURE 9 - STUDY FLOW DIAGRAM SHOWING THE NUMBER OF STUDIES SCREENED, ASSESSED FOR ELIGIBILITY AND INCLUDED IN THE REVIEW OF A LIBERALISED DIET FOR OLDER ADULTS WITH DIABETES.....	42
FIGURE 10- STUDY FLOW DIAGRAM OF SEARCH STRATEGY AND SCREENING OF RECORDS FOR SCOPING REVIEW OF MANAGEMENT GUIDELINES FOR OLDER ADULTS WITH DIABETES .....	54
FIGURE 11- CONTRIBUTING FACTORS TO RAC PHILOSOPHY IN PROVIDING A THERAPEUTIC ‘DIABETIC DIET’ VS DECISIONS INFLUENTIAL IN NOT PROVIDING A THERAPEUTIC DIET FOR AUSTRALIAN RESIDENTIAL AGED CARE SURVEY RESPONDENTS .....	77
FIGURE 12 - INTERVIEW GUIDE USED IN FOCUS GROUPS WITH RAC FOOD SERVICE STAFF.....	100
FIGURE 13 - NEW TOPICS CODED INITIALLY FROM SEQUENTIAL FOCUS GROUPS.....	104
FIGURE 14 - DINING ROOM 1 SCHEMATIC, N= 10 .....	120
FIGURE 15 – OBSERVATION DINING ROOM 2 SCHEMATIC, N = 18 .....	121
FIGURE 16 - OBSERVATION DINING ROOM 3 SCHEMATIC, N=20.....	122
FIGURE 17 - DINING ROOM 4 SCHEMATIC, N = 18 .....	123
FIGURE 18 - DINING ROOM 5 SCHEMATIC, N=20 .....	124
FIGURE 19 – QUESTION GUIDE AVAILABLE TO THE FOCUS GROUP COORDINATOR FOR COMMUNITY AND RESIDENTIAL AGED CARE COHORTS .....	144
FIGURE 20 - NUMBER OF NEW TOPICS DISCUSSED AT EACH SESSION FOR COMMUNITY AND RESIDENTIAL AGED CARE BASED OLDER ADULTS WITH DIABETES .....	147

## SUMMARY

The ageing population is set to become one of the most significant social transformations of the 21<sup>st</sup> century with a global rise in older adults from 15% to 25% of the population by 2050. A national priority for ageing in Australia is health and wellbeing across the life span. It is likely that 98% of the ageing population will have at least one chronic condition. Type 2 diabetes is strongly associated with obesity and ageing, and is a significant burden to health services globally as well as being an independent risk factor for entry to residential aged care in older adults.

Aged care reform has brought about changes to the way in which we approach aged care services. Guidelines are being re-developed with a consumer directed care focus. Currently residential aged care operates under a health model, with food services delivered using bulk catering offering a limited choice menu and set meal timings. Residents of aged care with medical conditions such as diabetes have historically been offered a special diet characterised by limiting added sugar and consistent serve sizes. However, recommendations to remove dietary restriction for all residents in aged care has been called for, in order to increase food choice and optimise oral intake to reduce risk of malnutrition.

In the absence of mandatory guidelines for nutrition in residential aged care, this thesis set out to explore what discordance might exist between the evidence and current recommendations for a liberalised diet for diabetes management, as well as what impact this may be having on what was actually being implemented in aged care facilities. In an explanatory sequence of mixed method studies this thesis identified a limited volume of evidence on which current recommendations for dietary management of diabetes in older adults have been based (chapter 3). In addition, while there are multiple diabetes management documents that include dietary recommendations, none are consistent: and aged care best practice guidelines are at conflict with general management guidelines in their key dietary messages (chapter 4). This discordance appears to be causing diversity in practice. The third study in this thesis identified that half of aged care facilities surveyed were still offering a traditional prescriptive diet (chapter 5). This was somewhat attributed to the lack of mandatory guidelines, differing opinion on how diabetes should be managed in older adults by physicians and dietitians prescribing the diets and a lack of ongoing education for staff in residential aged care (chapter 7).

Chapters 8 highlighted that a lack of guidelines and staff education in aged care is not only impacting older adults with diabetes but also those without. These findings and themes arising from focus groups in chapter 9 support that older adults desire to have control over their diet particularly into their later years, where they lament this may be their last locus of control. Conclusions drawn from the six studies that make up this thesis suggest widely accepted best practice guidelines are required but that a full food system approach to implementation would be necessary.

## DECLARATION

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

Signed.....*Olivia Farrer*.....

Date.....Amended following examination and signed, 9<sup>th</sup> November 2018.....

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## PUBLICATIONS ARISING FROM THIS RESEARCH

### Peer reviewed manuscripts

1. Farrer O, Yaxley A, Walton K, Miller M. Characteristics of older adults with diabetes: what does the current aged care resident look like? Nutrition and Dietetics, 2018; <https://doi.org/10.1111/1747-0080.12418>
2. Farrer O, Yaxley A, Walton K, Milte R, Miller M. The 'diabetic diet': a web based survey for determining the incidence, rationale, composition and implications in Australian residential aged care facilities. Jour Nursing Home Res. 2017; 3:50-3.
3. Farrer O, Yaxley A, Walton K, Healy E, Miller M. Systematic review of the evidence for a liberalised diet in the management of diabetes mellitus in older adults residing in aged care facilities. Diabetes Res Clin Pract. 2015; 108(1):7-14.

### Invited articles

1. 2017, Aged Care Insite: <https://www.agedcareinsite.com.au/2017/06/baby-boomers-presenting-unique-dietary-challenges/>
2. 2017, Health Times: <https://healthtimes.com.au/hub/nutrition-and-hydration/42/research/kk1/nutrition-for-the-modern-aged-care-resident/2587/>
3. Farrer O. Food for thought: dignity and quality of life in old age. Nursing and Residential Care. 2017; 19(6):312-4.
4. 2015, InDaily: <http://indaily.com.au/news/2015/05/29/do-all-older-adults-want-to-eat-cake/>

## CONFERENCE ABSTRACTS

### Oral Presentations

1. **DAA 34<sup>th</sup> National Conference.** Farrer, O., Yaxley, A., Walton, K. & Miller, M. The Modern Aged Care Resident – What do they look like, what do they want and what challenges does that present for Dietitians? Tasmania, 2017.
2. **British Society of Gerontology 44<sup>th</sup> National Conference.** Farrer, O., Yaxley, A., Walton, K. & Miller, M. Do all Older Adults Want to Eat Cake? Stirling, UK, 2016.

### Conference Abstracts - Posters

1. **10<sup>th</sup> Asia Pacific Conference on Clinical Nutrition,** Farrer, O., Yaxley, A., Walton, K. & Miller, M. Are baby boomers presenting new dietary challenges? Adelaide, 2017.
2. **10<sup>th</sup> Asia Pacific Conference on Clinical Nutrition,** Farrer, O., Yaxley, A., Walton, K. & Miller, M. Exploring staff knowledge of diet and diabetes and implications this may have for practice. Adelaide, 2017.
3. **British Society of Gerontology 44<sup>th</sup> National Conference,** Farrer, O., Yaxley, A., Walton, K. & Miller, M. The 'diabetic diet': a web based survey for determining the incidence, rationale, composition and implications in residential aged care facilities. Stirling, UK, 2016.
4. **Australian Association of Gerontology 43<sup>rd</sup> National Conference,** Farrer, O., Yaxley, A., Walton, K. & Miller, M. Do all Older Adults Want to Eat Cake? Alice Springs, Australia, 2015.
5. **DAA 32<sup>nd</sup> National Conference,** Farrer, O., Yaxley, A., Walton, K., Healy, E., & Miller, M. Systematic review of the evidence for a liberalised diet in the management of diabetes mellitus in older adults residing in aged care facilities. Perth, 2015.



## ABBREVIATIONS

ABS - Australian Bureau of Statistics

ACT – Australian Capital Territory

ACAT - Aged Care Assessment Team

ACFI - Aged Care Funding Instrument

AACQA - Australian Aged Care Quality Accreditation

ADA – American Diabetes Association

AGHE – Australian Guide to Healthy Eating

AND - Academy of Nutrition and Dietetics (formerly American Dietetic Association)

APD – Accredited practising dietitian

BGL – Blood glucose level

BMI – Body mass index

BMR – Basal metabolic rate

CDC - Consumer directed care

CDM - Chronic disease management

DAA - Dietitians Association of Australia

DAFNE - Dose adjustment for normal eating

DoH – Department of Health

DM - Diabetes Mellitus

DSA – Diabetes SA

FTE - Full time equivalent

GI – Glycemic Index

HbA1c - Haemoglobin A1c %

IFCC - International Federation of Clinical Chemistry

IDF - International diabetes federation

Kcals - Kilocalories

kJ – Kilojoules

LADA – late onset autoimmune diabetes in adults

LTC – Long term care

LOS - Length of stay

MNT – Medical nutrition therapy

NT – Northern Territory

NDSS - National Diabetes Service Scheme

NSW – New South Wales

NRV – Nutrient Reference Values

OGTT – Oral Glucose Tolerance Test

SA – South Australia

TAS - Tasmania

T1DM – Type 1 diabetes mellitus

T2DM – Type 2 diabetes mellitus

QEH – Queen Elizabeth Hospital

QLD - Queensland

RAC – Residential aged care

RACF – Residential aged care facility

SBREC - Social and Behavioural Research Ethics Committee

SPSS - Statistics Package for the Social Sciences

USA – United States of America

VIC - Victoria

WA – Western Australia

WHO – World Health Organization

yrs – Years

# CHAPTER ONE - INTRODUCTION

## 1.1 Rationale

The ageing population is set to become one of the most significant social transformations of the twenty-first century, with implications for nearly all sectors of society, including housing and healthcare <sup>(1)</sup>. An increase in the number of older adults (60 years or older) is accompanied by a decline in population numbers for younger adults. The proportion of older adults globally is proposed to rise from 15% to 25% of the population by 2050 <sup>(2)</sup>. This is mirrored in projections for Australia where a low birth rate and increased life expectancy are both contributing factors to growth in the older adult population <sup>(3)</sup>. This is in addition to the sustained post war baby boom spanning two decades in Australia, and contributing to the 'bulge' in the Australian population pyramid as seen in Figure 1 <sup>(4)</sup>. The dark shaded bands illustrate the cohort of post war babies as they continue to age, and who are often referred to in the literature as the 'baby boomers' <sup>(5)</sup>. This group are set to contribute to the inflation of the number of older adults ( $\geq 65$  yrs) from 14% of Australia's population in 2012 to 22% in 2061 <sup>(4)</sup>.

Currently there are approximately 3.7 million older adults in Australia <sup>(6)</sup>. In 2011 the Australian Bureau of Statistics (ABS) found that 67% of older adults aged 65-74 years were living in their own home, more often with a spouse or family member: but this number dropped to only 23% for older adults aged 85 years and over <sup>(7)</sup>. Older adults not living in their own home were typically living in nursing home style accommodation now known as 'residential aged care' (RAC) <sup>(7)</sup>. RAC provides 24 hour support to older adults typically aged 65 years and over either for temporary respite or rehabilitation, or more commonly as a permanent accommodation arrangement. While the age range can be broad in RAC, older adults 85 years and over make up 57% of the permanent resident population <sup>(8)</sup>. The typical length of stay is between 2-5 years, and it is generally accepted that for 91% of older adults in RAC, this will be their home until end of life <sup>(9)</sup>.

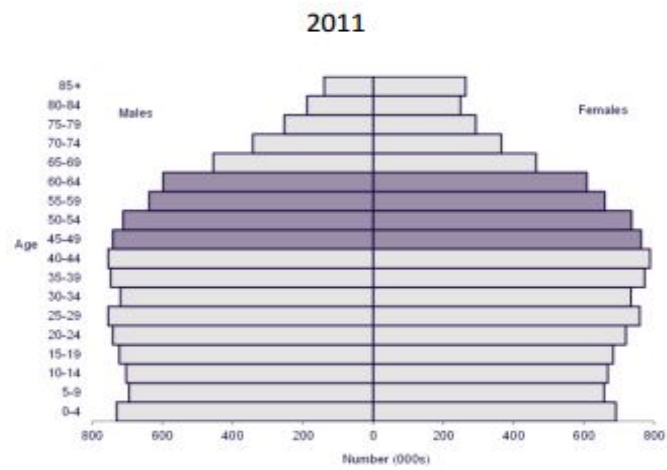
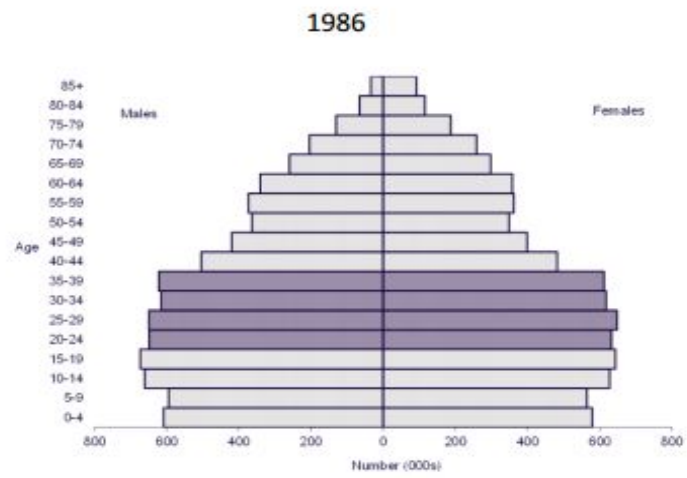
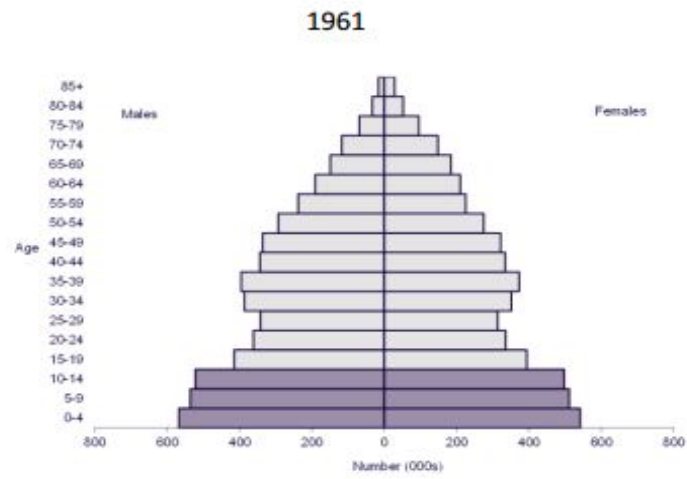


Figure 1 - Australian population structure by age and sex 1961 – 2011

The Aged Care Act (1997) and associated principles provide a framework for the funding and regulation of RAC. The Australian governments' Department of Health (DoH) is also responsible for actioning these regulations in conjunction with external contractual arrangements in the aged care sector. The cost of RAC is funded by contributions from both the individual and the Australian government, with subsidies calculated using the 'Aged Care Funding Instrument' (ACFI) <sup>(10)</sup>. The greater the care need, the higher the subsidy paid for that individual: this funding can also support older adults with in home supports in the community, prior to needing residential care. In addition ACFI funding for RAC can fund services such as allied health and some physical resources: although at this time nutrition and dietetic services are not funded under this scheme.

The aged care system in Australia has undergone major reform in the last few years, the results of which are still being implemented in practice. Consumer directed care (CDC) is now the focus, meaning that older adults will have more control over how they engage with services as they require them. A comprehensive review of legislation has been undertaken in the Aged Care Act (2013) under the 'Living Longer, Living Better' package, which is intended to improve access, quality and consumer choice for affordable care as people age <sup>(11)</sup>.

A national priority for ageing in Australia is health and wellbeing across the life span <sup>(12)</sup>. This is particularly important as the ageing population are more frequently known to have one or more chronic health conditions, particularly those associated with overweight and obesity <sup>(12-14)</sup>. In a review of health survey data by the ABS, 98% of middle aged adults aged 45 years and over reported having a long term condition, or 'chronic condition' such as cancer, asthma, coronary heart disease or diabetes <sup>(12)</sup>. In particular, baby boomers are visiting health services more frequently for management of chronic conditions <sup>(15, 16)</sup>.

Type 2 diabetes is a chronic condition strongly associated with overweight and obesity, hypercholesterolaemia and hypertension: subsequently poor diabetes management is associated with cardiovascular events and comorbidity <sup>(17)</sup>. This is a concern as type 2 diabetes is said to be at pandemic levels worldwide and is a significant health and financial burden to health agencies <sup>(18)</sup>. Globally it is estimated that diabetes prevalence will rise from 382 million people (2013) to 592 million people by 2035 <sup>(2)</sup>.

### **1.1.1 Diabetes Mellitus**

There are different types of diabetes, the main forms of which are:

- Gestational diabetes
- Type 1 diabetes, which can include late onset autoimmune diabetes in adults (LADA); and
- Type 2 diabetes <sup>(18)</sup>.

Gestational diabetes is a temporary form of diabetes experienced in pregnancy and therefore not discussed when referring to diabetes in this thesis. Type 1 diabetes (and LADA) is an autoimmune disorder and results when the body's own immune system destroys the pancreatic beta cells that would typically produce insulin. Late onset autoimmune diabetes in adults is frequently misdiagnosed as type 2 diabetes but is actually a slow onset of type 1 diabetes and accounts for approx. 10% of all diagnoses. Diagnosis of LADA is tested through presence of autoantigen-antibodies, as would also be found in diagnosis of type 1 diabetes. Progression to full reliance on insulin is slower in LADA and can be up to 6yrs, hence the confusion with type 2 diabetes <sup>(17)</sup>.

Although there are many similarities in the presentation and management of type 1 and type 2 diabetes: in type 1 diabetes there is an autoimmune pathology and absolute deficiency of insulin. This requires the individual to always rely on injected insulin, whereas in type 2 diabetes insulin resistance is the primary mechanism. Type 2 diabetes is a progressive condition with increasing loss of insulin producing beta cells, however some residual insulin will always be produced. Type 2 diabetes is a chronic disease that occurs when the body cannot produce enough insulin or cannot use insulin effectively <sup>(18)</sup>. Type 2 diabetes is known to be exacerbated by central obesity and is frequently associated with metabolic risk factors such as high blood pressure and high cholesterol <sup>(17)</sup>.

### **1.1.2 Pathophysiology of diabetes**

Diabetes describes a cluster of metabolic disorders and is characterised by hyperglycaemia and disordered insulin production and utilisation. Although the cause for onset of type 1 and type 2 diabetes is unknown, particularly triggers for the onset of autoimmune type 1 diabetes: there are known risk factors for the onset of type 2 diabetes. Type 2 diabetes accounts for approximately 90% of all diabetes diagnoses in adults and where not differentiated in this thesis, is the form of diabetes being discussed throughout. A number of modifiable and non-modifiable risk factors

have been identified. Non modifiable risk factors include ageing, ethnicity, genetics and if the individual has had gestational diabetes. Modifiable risk factors include lack of physical activity, high blood pressure or cholesterol and/or overweight and obesity (particularly central obesity). Hence nutrition and lifestyle modification are key management strategies.

Obesity is defined in the literature as a weight to height ratio or body mass index (BMI) of  $>30 \text{ kg/m}^2$ . A healthy weight range is designated between  $18.5 - 24.9 \text{ kg/m}^2$ , and BMI  $25 - 29.9 \text{ kg/m}^2$  as the overweight range for Caucasian adults <sup>(19)</sup>. A modified range for BMI has since been suggested for older adults which is thought to reduce premature mortality risk in this cohort <sup>(20)</sup>. Underweight is typically regarded as a BMI  $<18.5 \text{ kg/m}^2$ . However, studies now propose a healthy range for older adults ( $>65\text{yrs}$ ) of BMI  $23 - 30 \text{ kg/m}^2$ , meaning that being overweight is somewhat protective for older adults. A meta-analysis by Winter et al (2014) found that being moderately overweight did not increase mortality in older adults, although the correlation was 'U' shaped and a BMI  $>30.9 \text{ kg/m}^2$  is associated with higher mortality risk <sup>(20)</sup>.

Obesity is multifactorial in cause but over-nutrition whereby more energy is consumed than expended is a factor primarily addressed by dietitians using medical nutrition therapy (this could also be described as nutrition intervention or advice) <sup>(21)</sup>. Excess energy is stored as adipose tissue which continues to expand while the body is in positive energy balance, causing weight gain. Ideally a diet that promotes energy balance is desirable for optimal weight management and is typically achieved when energy from food is consumed in balance with energy expended. Energy expenditure can also be influenced by the level of physical activity an individual engages in and their basal metabolic rate (BMR). Both activity and BMR reduce in later years and so older adults may require less energy (kJ) but the same if not more, of certain macro and micronutrients such as protein, calcium and vitamin D. Excess energy intake is stored as fat which is more likely to accumulate around the waistline in older adults. Central obesity, or visceral fat, is particularly associated with diabetes and cardiovascular risk <sup>(17)</sup>. In addition normal processes in ageing also cause an increase in visceral fat and reduction in lean body mass, independent of oral intake <sup>(22)</sup>. Hence ageing is an independent risk factor and sometime referred to as a catalyst for onset of type 2 diabetes, particularly in the presence of obesity.

Lifestyles that are low in incidental or planned activity are also associated with risk for diabetes onset. Evidence suggests that low physical activity levels is another independent risk factor for



diabetes, the mechanism for which is related to an increase in insulin resistance which negatively impacts glycaemic control <sup>(23)</sup>. Studies propose that even a modest increase in activity can improve insulin sensitivity <sup>(24)</sup>, with up to 12 hours of improved glycaemia when engaging in the recommended 30 minutes of activity per day <sup>(25)</sup>. Resistance training has been particularly noted as beneficial for reduction in insulin resistance, and its low intensity has gained interest in the management of diabetes in older adults who have limited capacity for aerobic style exercise <sup>(26)</sup>. Older adults with diabetes have significantly lower muscle mass than the general population, manifesting as lower strength and poor mobility in these individuals <sup>(27)</sup>. Resistance exercise in particular is known to be beneficial to all older adults but particularly older adults in supporting preservation of lean body mass <sup>(28)</sup>. However at this time physical activity programs or mobility exercises with a physiotherapist are also not supported under the ACFI model for RAC <sup>(10)</sup>. As physical activity is unlikely to be a strategy for management of glycaemia for older adults with diabetes in RAC, it has not been discussed again within the scope of this research when discussing diabetes management.

Non-modifiable inherited or genetic factors can also increase risk of developing diabetes <sup>(17)</sup>. Regardless, both genetic and modifiable risk pathways lead to diabetes through the accumulation of glucose in the blood and hyperglycaemia as a result of this disordered use and reduced availability of insulin, as seen in Figure 2. However, the presence of obesity and associated comorbidities such as high blood pressure (hypertension), elevated cholesterol (hypercholesterolaemia) also predisposes an individual with diabetes to an increased risk of a cardiovascular event. The consideration of all comorbidities should therefore be considered in the nutrition therapy of older adults with diabetes <sup>(2)</sup>.

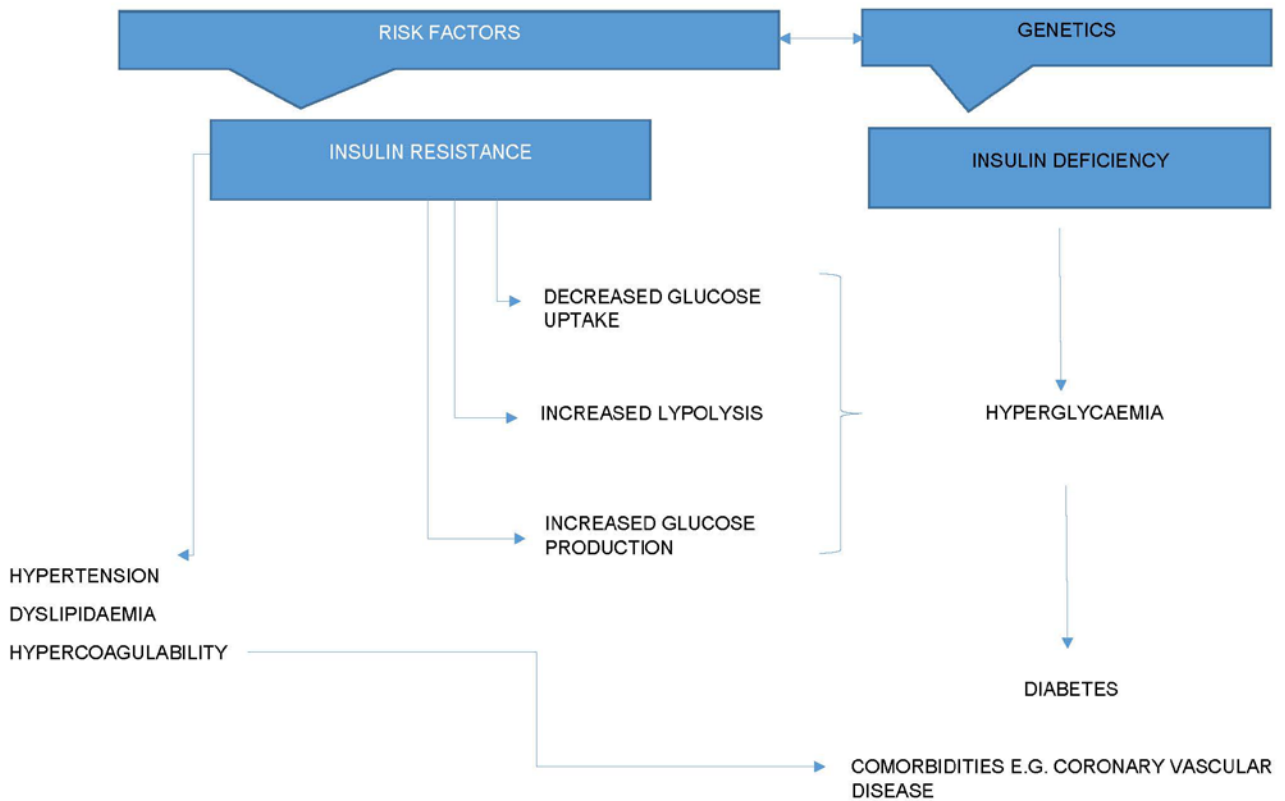


Figure 2 - Overview of diabetes pathology and causes of hyperglycaemia <sup>(17)</sup>

The diet and lifestyle management of all forms of diabetes is similar and is designed to help stabilise day to day blood glucose levels whilst also reducing risk of these other comorbidities <sup>(17)</sup>. A healthy diet and lifestyle also supports healthy weight management, which is particularly important where obesity is an issue and exacerbating insulin resistance <sup>(2, 17)</sup>. Where diet and lifestyle cannot adequately manage glycaemia, anti-hyperglycaemic medication is initiated and is followed by injected insulin as the individuals' insulin deficiency increases <sup>(17)</sup>.

Within the changing landscape of health management and ageing, the dietary management of this population has been much scrutinised over the last 20 years <sup>(29)</sup>. As described, typically the literature has supported a lifestyle approach to the management of type 2 diabetes in all adults, with an emphasis on healthy weight and exercise to best manage glycaemia and prevent complications <sup>(30)</sup>. Similarly, medical nutrition therapy (MNT) in institutions both acute and long term (such as RAC) has offered a healthful diet, limiting added fat and sugar and using a prescriptive approach to carbohydrate volumes <sup>(31)</sup>. However, there has been much negative

attention drawn to the use of therapeutic diets which included dietary restriction, such as that offered to people with diabetes in these environments, particularly where oral intake is already thought to be compromised <sup>(29, 32)</sup>. Diets provided in RAC have been especially critiqued as protein-energy malnutrition (under-nutrition) evidenced by unintentional weight loss in institutional care has been reportedly as high as 80% in residents <sup>(33)</sup>, and is associated with negative impact on quality of life and poor health outcomes. Therefore it has been proposed that previously restricted diets should be liberalised, and individualised. To some extent this has been implemented in less prescriptive dietary recommendations for older adults with diabetes in RAC institutions <sup>(29, 34, 35)</sup>. However, dietary advice for older adults with diabetes living in their own homes remains the same as for the general population and younger adults with diabetes (<65yrs). This promotes a low fat, low added sugar diet and healthy weight management: which would be liberalised on an individual basis in the event of sickness or unplanned weight loss <sup>(17, 30)</sup>. Older adults with diabetes not in RAC are more often referred to as 'functionally independent' and for whom medical nutrition therapy can be better manipulated and individualised <sup>(2)</sup>.

However individualising dietary recommendations in RAC is more problematic than in a community setting, where the food service system is set up to offer a default diet which permits only minor modifications for predetermined diet codes: which may or may not have been developed in conjunction with a nutrition expert. Currently the Department of Health (DoH) and the Australian Aged Care Quality Agency (AACQA) jointly oversee the provision of aged care services and is responsible for accrediting RAC providers. RAC facilities must be accredited to provide care to older adults under the Act (1997). Nutrition and hydration are a section on which RAC must be accredited through AACQA <sup>(36)</sup> under the current standards until July 2019: whereupon a new client centred standard will become the benchmark for auditors. However both the current and new client centred standard are broad and it is left up to the individual facilities as to how they interpret food service recommendations for all residents as well as those with therapeutic dietary needs. As such, it is inevitable that there will be variability in food service systems in both the delivery of food services between and within states, and between individual RAC institutions.

In the absence of comprehensive or mandatory guidance for menu design and delivery, several practice documents have been developed for use in Australian RAC. The guideline most frequently

cited by practitioners working in RAC <sup>(37)</sup>, approaches menu design with a prophylactic approach to malnutrition and has mostly removed MNT for individuals with diabetes <sup>(29)</sup>. The consequences of non-mandatory guidelines for RAC, and subsequently the dietary management of older adults with diabetes receiving a menu not based on MNT, has not been explored in the published literature. A lack of mandatory service benchmarking in this setting has the potential to contribute to inconsistencies in practice in RAC, which has the potential to impact on quality of life for these individuals. But also, discordance in approaches between diabetes management for older adults in the community and RAC may also impact on the transition of this population as they progress through ageing community services (for which no guidelines currently exist), into RAC <sup>(5, 16)</sup> as well as their diabetes health outcomes. Therefore this research aimed to explore how the food service system is impacted by this lack of guidance and what implications this has for key stakeholders such as staff and RAC residents.

The research utilised a pragmatic approach, allowing for selection of methods best suited to identifying the policies and guidelines pertinent to diabetes management in older adults and to examine practices around meal provision in RAC. This research also aimed to explore the lived experience of dietary management of diabetes in older adults in RAC as well as the perceived wants and needs of baby boomers in the community. The research was approached with reference to the food systems model as proposed by Vaden (1980)<sup>(38)</sup> and later adapted for food services by Lengyel et al (2003)<sup>(39)</sup>, which recognises that all parts of a system are impacted by change and may affect output.

## **1.2 Food service systems model as a framework**

The food systems model as described by Lengyel et al (2003) <sup>(39)</sup> originates from a general systems theory <sup>(40)</sup> and subsequent food service systems model by Vaden (1980)<sup>(38)</sup>. The framework aims to visually represent an organisation; in this scenario, food services, and to represent key components as well as demonstrate how they interact with each other and the environment <sup>(41)</sup>. The best known example of a food service systems model was proposed by Vaden (1980) which consisted of six components which can all be influenced by both internal factors such as food experience; or external factors, such as the setting in which the system operates <sup>(38)</sup>. Figure 3 is an example of how the Vaden model is set out, the bi-directional arrows illustrating the nature of the relationship between components and their environment.

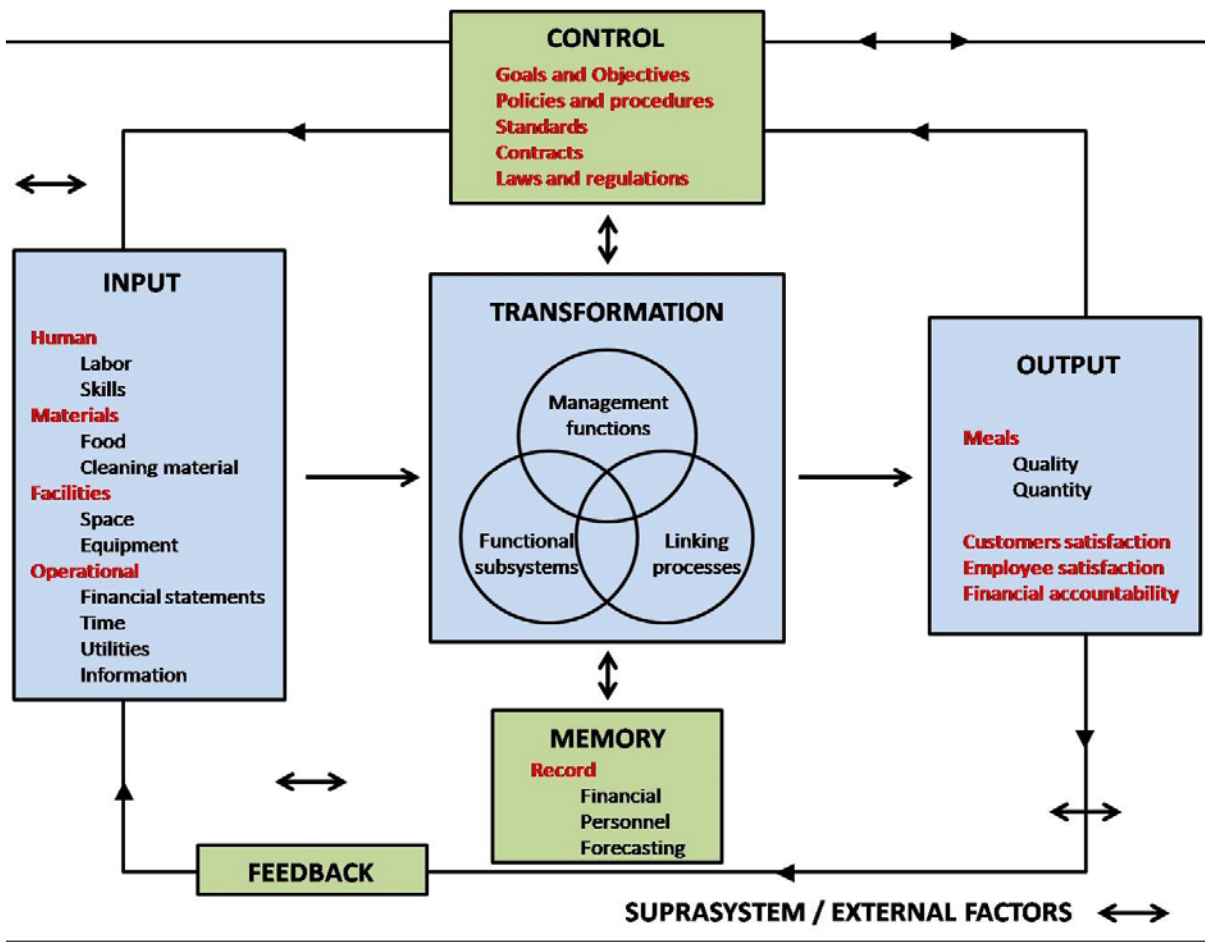


Figure 3 - Food service systems model adapted from 'A model for Evaluating Foodservice System', by A.G. Vaden (1980)

Although this is deemed a practical way to understand the operations of a system, it is not without its limitations. In particular this system has been critiqued for its ability to adapt to change such as in growth of an organisation or intra-organisational conflict, since the system is considered holistically as a whole entity <sup>(39)</sup>. A review of this model by Lengyel et al (2003) found that the model was less useful in adapting for changes that were occurring to the health industry and suggested a revision was warranted <sup>(39)</sup>. The shifting paradigm to client centred care in health care has increased interest in understanding how quality of life is impacted by food service delivery, particularly in a long stay setting such as RAC. Lengyel et al proposed that a modified systems model, named the PROTEC food service systems model, might offer a more modern approach to the Vaden model <sup>(38, 39)</sup>. Figure 4 outlines the PROTEC model, where each letter of the acronym relates to a component of the model: Potential change indicators, Resources, Outcomes, Transformation, Environmental context, and Controlling factors <sup>(39)</sup>.

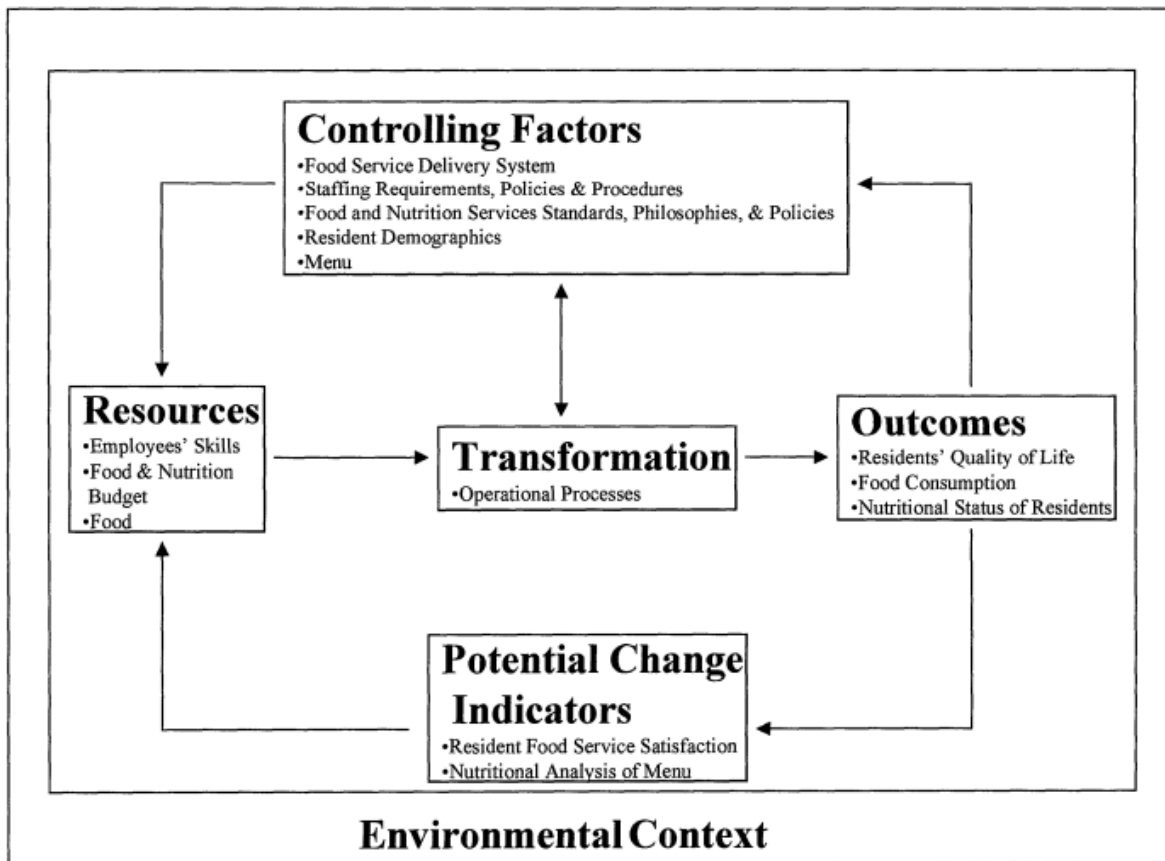


Figure 4 - Lengyel et al (2003) PROTEC Food service model

The components of the model can then be further explained within the framework in which it is intended for use. For example in the research by the authors of the model, nutrition and food service related outcomes were: resident quality of life, food quality and quantity and nutritional adequacy of menus <sup>(39)</sup>. It was identified that in order to produce the desired outcomes that meet the goals for service, appropriate controls need to be put in place <sup>(39)</sup>. Controlling factors are typically the service standards, guidelines or policies that determine the type and goals for service. Potential change indicators are the feedback component which is essential in measuring the success of the system and to maintain the dynamic nature of the model. Finally the environmental context is acknowledged in this model and can refer to a number of variables such as food experience, personal health beliefs or medical conditions and to the actual environment the system exists in e.g. RAC vs acute care.

This model resonated with the research presented in this thesis, which was exploring the discordance between policy and practice in the dietary management of older adults with diabetes

within a food service system in RAC, particularly in the shifting paradigm this is currently undergoing. This research aimed to explore and generate new information on the impact of a lack of mandatory guidance or 'controlling factor' on how food services were operating in RAC facilities across Australia; how this was impacting staff (resources) and resident outcomes for diabetes outcomes, satisfaction and food choice (outcomes); as well as considering how this might impact future generations of older adult with diabetes who may not present with the same demographics or clinical presentation as their older peers (potential change indicator / environmental context). Figure 5 outlines how the PROTEC food service model provided a framework for this thesis and subsequently the research questions and studies that it comprises.

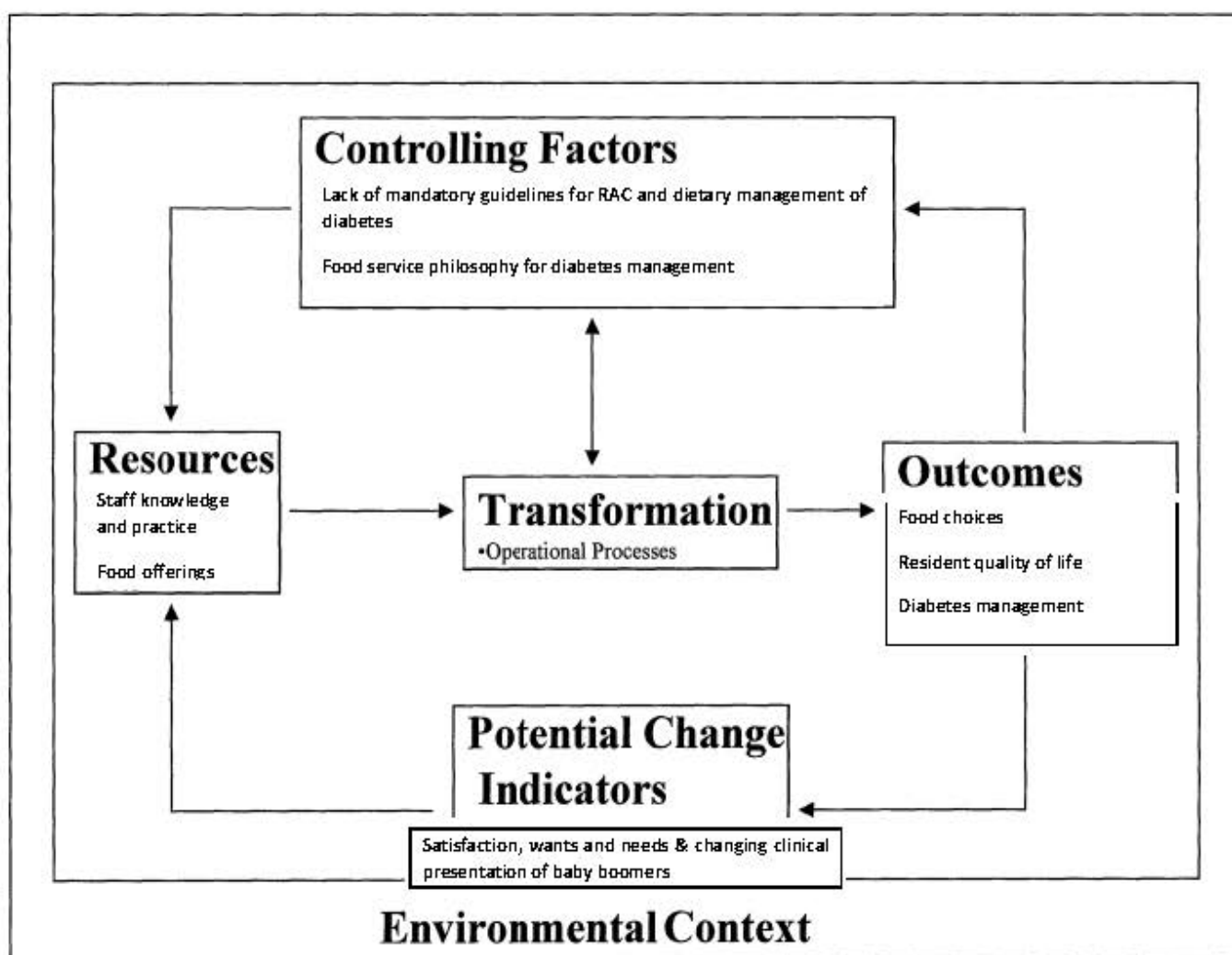


Figure 5 - Adapted PROTEC food systems model providing a framework for the research entitled *The discordance between policy and practice in the dietary management of diabetes in RAC*

## **1.3 Research questions**

This mixed methods research proposed to address the following research questions and were approached in an explanatory sequential sequence. This approach recognises the strengths and limitations of both quantitative and qualitative methodological approaches, and thereby aimed to strengthen applicability of findings by combining methods to address the overall mixed methods research question outlined below, methods will be discussed more fully in chapter 2. Chapters 3-6 addressed the quantitative questions before the qualitative studies are discussed in chapters 7-9, which were designed to better explain these findings. Collectively each study intends to add an original contribution to knowledge on this topic, while addressing each research question:

### **1.3.1 Quantitative**

1. What evidence is there to support a liberalised diet for diabetes management in older adults?
2. What international and local evidence based guidelines exist to guide the dietary management of older adults with diabetes in RAC?
3. To what extent are Australian RAC implementing liberalised diet recommendations for older adults with diabetes?
4. How much does the current cohort in RAC reflect older adults with diabetes as described in the wider literature?

### **1.3.2 Qualitative**

1. How has the lack of mandatory guidelines impacted staff knowledge and practice in RAC?
2. Does having diabetes change mealtime practices or interactions with staff in RAC?
3. What is the lived experience of older adults with diabetes and diet in RAC, and how do baby boomers perceive their needs will be met as they look to the future?

### **1.3.3 Mixed methods**

What discordance exists between policy and practice for dietary management of older adults with diabetes in RAC: and how is this impacting the key stakeholders (staff and residents)?



## 1.4 Research objectives

The objectives of this research were:

1. To identify and evaluate the evidence underpinning current guidance for the liberalised dietary management of diabetes
2. To identify international and local documents that could be referred to for the management of older adults with diabetes
3. To determine the extent to which a liberalised diet was being provided to older adults with diabetes in Australian RAC and the philosophy for doing so
4. To compare the current typical presentation of older adults with diabetes in RAC with assumptions made about this cohort in the wider literature
5. To explore awareness of recommended changes to diet and diabetes management with RAC staff and how this is influencing their practice
6. To observe mealtime interactions between staff and older adults with diabetes, in particular with respect to food choices and offerings
7. To explore how changes to diet and diabetes management have affected the lived experience of current residents
8. To explore perceived wants and needs of baby boomers with respect to diabetes management in supportive living, such as RAC

## 1.5 Summary

*The discordance between policy and practice in the dietary management of diabetes in RAC* is a mixed methods study within a food service framework that examines the rationale and impact of changes in practice for diabetes management in older adults. These changes are explored with respect to by how much changes have been implemented in practice as well as how they have been received by key stakeholders such as staff and residents. There is an absence of mandatory guidelines for the management of diabetes in older adults. This work intends to generate new knowledge on the preferences of older adults with diabetes, with respect to chronic disease self-management and diet: which is poorly represented in the current literature. The chapters in this thesis are arranged as follows:

**Chapter 2** provides an overview of the food service systems models as a framework for this research as well as discussing the research methodology used in this thesis.

**Chapter 3** is a systematic review of the literature that has been drawn on to influence the change in practice for the liberalised dietary management of older adults with diabetes within Australia but which has not been adopted in some overseas countries, such as the UK.

**Chapter 4** identifies the documents that have been developed based on the evidence discussed in chapter three, and that could be used to guide dietary management of diabetes in older adults. This scoping review documents key nutrition messages that were compared and evaluated for quality and applicability to practice. This chapter also highlights the variability in recommendations for diabetes management of older adults locally and internationally.

**Chapter 5** provides an insight into how many Australian RAC currently offer a liberalised diet for diabetes management to their residents. The chapter also includes discussion of the philosophy behind changing dietary practices and some indication of what the current 'diabetic diet' might look like in terms of food choice and offerings.

**Chapter 6** presents data on the current clinical presentation of older adults with diabetes in RAC and draws comparisons with the assumptions made in the literature outlined in Chapter 4. The data is stratified to help identify differences between generations of older adult which may have implications for future practice guidelines.

**Chapter 7** is the first of three qualitative studies described in this thesis, and further examines the awareness of recommendations for the dietary management of diabetes in RAC. The study uses a focus group approach and considers how clinical updates are received by RAC staff (if at all) and how personal health beliefs might also influence the care of this cohort.

**Chapter 8** builds on findings from Chapter 5 and Chapter 7, and is an observation of mealtime practices in RAC. Observations were intended to identify any differing practices for residents with diabetes as compared to their peers without diabetes: such as more limited food choices or withholding of meal items.

**Chapter 9** is the final qualitative study and also utilises focus groups to understand the lived experience of older adults with diabetes already in RAC, compared with the perceived needs and wants of baby boomers with diabetes as they consider their own ageing. Baby boomers are motivating many changes to aged care delivery which extends to institutional food service; with autonomy and choice being highlighted as key concerns. Diabetes education has undergone its own reforms whereby individuals are now empowered to 'self-manage' their health. It is with this in mind that this final study also considers to what extent the current food service approach can support the perceived wants and needs of baby boomers with diabetes.

**Chapter 10** will provide a discussion of the key findings within the framework of the food systems model.

## CHAPTER TWO – RESEARCH METHODOLOGY

### 2.0 Overview

As outlined in chapter one, the research methods for this thesis utilised both quantitative and qualitative approaches to best address the research objectives<sup>(42)</sup>. The objectives were examined through a series of studies and utilised a pragmatic approach to methodology selection incorporating first quantitative and then qualitative methods of inquiry. Quantitative methods were used initially to better understand what guidance for diabetes management in older adults was available, the characteristics of the cohort (older adults with diabetes) and the extent to which RAC policy makers were aware of changes in approach to MNT. Qualitative methods were subsequently employed to better understand how nursing and food service staff were translating the changes in practice.

The studies in this thesis also sought to explore how policy changes had been received by older adults with diabetes, both in an RAC setting and from the perceived needs of prospective users of RAC. Policy changes for dietary management of diabetes frequently cite that dietary flexibility will improve resident quality of life. However, for older adults with diabetes, there is no published literature to support this theory as yet. This thesis aimed to provide original contribution to this under-studied area.

Studies were intended to inform the next within a pragmatic explanatory sequential design, before the findings were summarised and discussed in response to the overall mixed method research question in chapter ten. Figure 6 outlines the sequential approach of the studies within this thesis. It is intended that the findings from this thesis will add new information to the limited body of literature on this topic and may contribute to the future development of aged care guidelines for food services and/or management of older adults with diabetes. This chapter will provide an overview of the methods used in the series of studies included in this thesis.

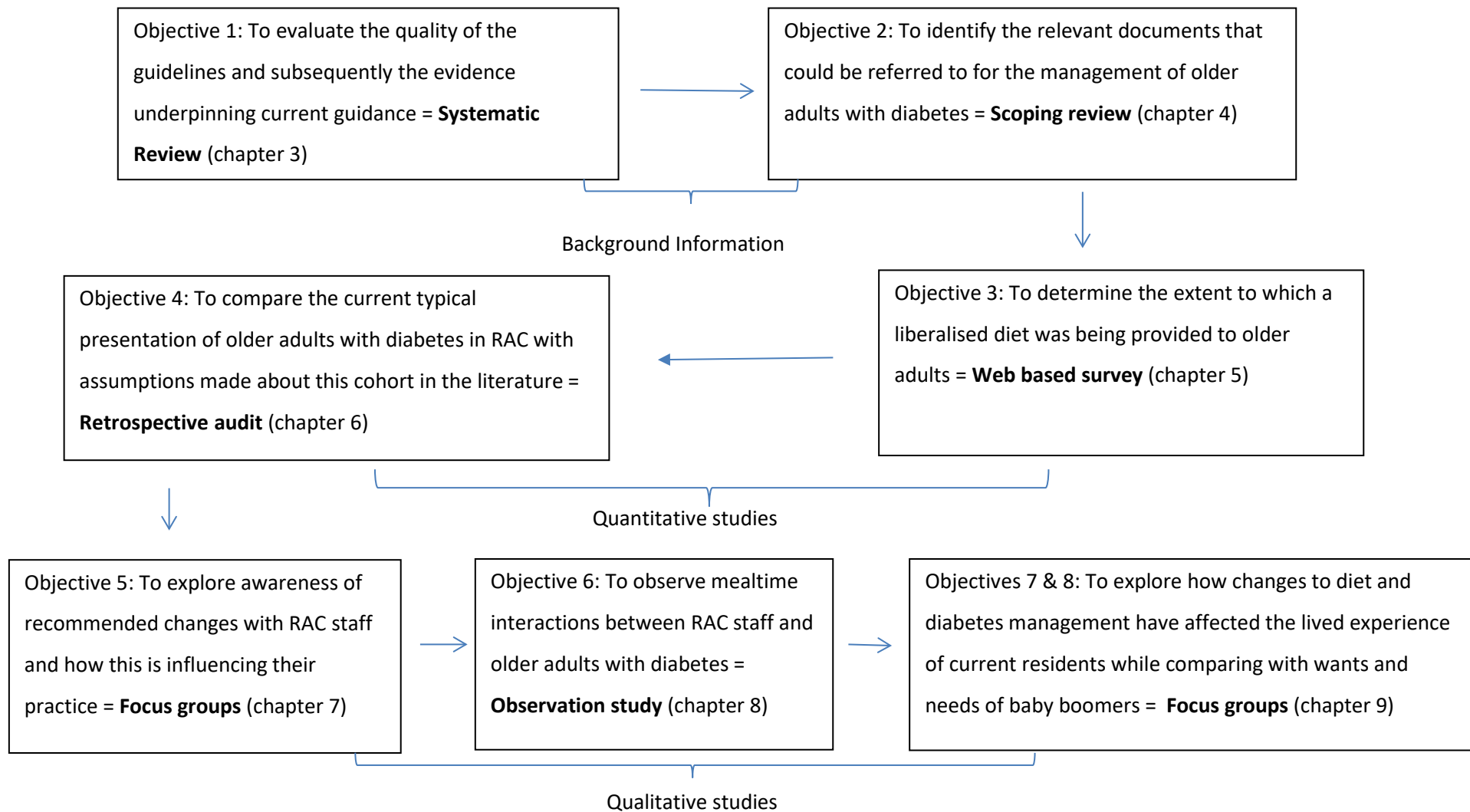


Figure 6 - Sequential design of studies to identify the discordance between policy and practice in the dietary management of older adults with diabetes

## **2.1 A Pragmatic approach to research design**

The combination of research design or 'mixed methods approach' emerged as a third methodological movement in social and behavioural sciences in the 1980s <sup>(43)</sup>. Although the definition has been somewhat contested, it is generally accepted that the mixed methods research design has "*philosophical assumptions as well as methods of inquiry...that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies*" <sup>(44)</sup>. It has been suggested that it is logical that mixed methods research should be pragmatic; particularly where the research is practical and outcome-orientated <sup>(45)</sup>. It is this acknowledgment of a 'pragmatic approach' as being a paradigm in its own right that has allowed researchers to select a methodology which best suits the research question <sup>(46)</sup> and which has been referred to in this thesis.

### **2.1.1 Quantitative methods**

The first study that was undertaken in this thesis was the systematic review and appraisal of the literature that brought about a change in practice for dietary management of diabetes in older adults. Systematic reviews are widely used in evidence based healthcare, rather than a narrative or literature review <sup>(47)</sup>. The reason for this being the explicit methodology and quality appraisal that this method offers thereby providing robust and reproducible findings on which to base practice. Following a review of the literature to ascertain what guidance was available to clinicians working with older adults with diabetes, several studies were undertaken to better understand the impact of a lack of mandatory guidance for RAC. Initially quantitative methods were employed to define the landscape and population of interest. A second review, this time a scoping review, was undertaken to examine how the literature had been interpreted into practice recommendations. A scoping review methodology, rather than another literature review, was selected to best suit the research aim; which was to scope and appraise available guidelines rather than combining and reviewing the documents. The Joanna Briggs Institute methodology <sup>(48)</sup> was loosely referred to in the steps taken to conduct the scoping review and is discussed more fully in chapter four.

Chapter five next used a survey design to explore the extent to which a liberalised diet has been implemented in practice. The research objective required a broad sample size, ideally Australia wide and surveys have been frequently used to access otherwise hard to reach participants within

a large sample size. This is also a generally accepted and reliable way to achieve datasets that when analysed offer potential for generalisability. However, it is acknowledged that there are limitations to the use of surveys. Online surveys frequently achieve a 10% lower response rate than paper based surveys, but do offer more convenience in distribution and collection and analysis of the data <sup>(49)</sup>. Face to face or telephone interviews were not a pragmatic method for this study and so steps were taken to manage study design limitations.

One such limitation can be in the analysis of responses which is known to be somewhat impacted by the quality of the answers provided. The survey design and the lack of opportunity to capture broad opinion or clarify information where it has not been understood is a potential confounder. Survey questions can be poorly phrased and therefore the answers are not reliable. However this can be managed through the careful development of the questions and piloting before distributing the final version <sup>(50)</sup>, which was done in the study discussed in chapter five. While the response achieved in this study was adequate to provide an indication of prevalence of a liberalised diet, further qualitative studies exploring the practical management of older adults with diabetes was deemed necessary to further explain findings.

The final quantitative study, a retrospective audit (Chapter six), aimed to capture more current data on the characteristics of the population being studied. This is particularly as the rationale for changes to dietary practices was largely concerned with the weight loss and under-nutrition risks that older adults with diabetes in RAC were proposed to be susceptible to on a therapeutic diet <sup>(32, 51)</sup>. However this data was at least two decades old and was potentially not best representing the current ageing population. In the audit discussed in chapter six, most of the demographic data was available for all residents, and anthropometric data was captured for several time points included admission and time of audit, which offered some insight into possible weight trends over the length of stay. The data was consistent with the quality of what had been captured previously in the literature and also included discussion of malnutrition screening scores, which were not discussed in other demographic studies. A limitation of this study design is that its cross sectional approach relies on accuracy and availability of documentation, and cannot offer explanation for findings such as weight gain or loss over a particular time period. Similar to a survey design, an audit relies on correct and complete information being recorded for analysis. However, strengths of this design are that in applying a power calculation (with a 95% CI) sufficient data to describe the population was collected on which some assumptions could be made for further studies and

the data could then be discussed in reference to the general population of older adults with diabetes in RAC.

Overall, sampling in the quantitative studies was as broad as was viable, particularly where a statistically significant sample size could be achieved to increase generalisability (chapter six). The review of the literature was only limited to the population of interest with few other exclusions. The web survey was distributed to all RAC facilities in the country, whether private, church affiliated or government owned. In addition, the retrospective audit discussed in chapter six removed any exclusion criteria to best capture a broad set of data on the population of interest and facilitate generalisability in the findings. The RAC sites for recruitment were consistent from the quantitative studies into the qualitative studies. Although more purposeful sampling of residents and staff were sought for qualitative focus groups as discussed in the relevant chapters' methods. Further strengths and limitations of the methods are discussed within the individual chapters.

### **2.1.2 Qualitative methods**

Qualitative research is more interpretative and generates non-numerical data that can offer insight into cultural phenomena. Qualitative methods have gained interest and acceptance in the past two decades, particularly in the field of health research <sup>(52, 53)</sup>. The ability to combine the strengths of qualitative and quantitative research in either one study or series of studies have been particularly utilised in health service interventions and especially in chronic illness management studies (such as study of diabetes management) where it is necessary to address complex and multifaceted issues <sup>(52-56)</sup>.

The propensity of qualitative research to investigate behaviour and experiences or why people act in certain ways is a good fit for research in the field of nutrition and dietetics <sup>(57)</sup>. Food has many roles within our social world, whether it be food as a control mechanism, eating and preparing food for pleasure and in socialising; or as a strategy for achieving good health, such as in MNT <sup>(58, 59)</sup>. Dietitians are looked to as the experts in MNT with practices based on the best evidence available and forming practical advice to promote health and wellbeing to the general population in a range of settings. This could include policy design and implementation, or conducting the research to inform such documents <sup>(53)</sup>.



The purpose of using qualitative methods in this research was to gather explanatory data, to better understand findings raised by the quantitative studies, such as:

- Focus groups with RAC staff in chapter seven helped contextualise the issues with non-mandatory guidelines for the care of older adults with diabetes at a practice level. Quantitative findings can determine variability in controls and glean a broad overview of the impact on resources, such as menu design, and outputs such as number and types of food choices. However qualitative data examines the human resources that impact a food service system and how individuals' perceptions and beliefs might apply to food offerings and mealtime interactions.
- The observational study in chapter eight, builds on both the quantitative data from chapter five and qualitative data from chapter seven, to more deeply explore practice and compare with what had previously been reported in the focus groups. In this instance the study aimed to observe any different management of older adults with diabetes as compared to their peers without diabetes, at mealtimes in RAC.
- Finally, chapter nine again employed a focus group approach to assess resident satisfaction with food services in their respective RAC facility. This was then compared and contrasted with the perceived wants and needs of baby boomers, who were not yet in the RAC system. This study aimed to provide insight into the quality of life residents with diabetes might have, which was not well explored in the reviewed literature (chapter three). It also aimed to provide new information on which future recommendations could be based.

Whilst qualitative data is not empirically generalizable to the wider population, it is useful in generating theoretical propositions and can expose key issues without removing context <sup>(60)</sup>. Combining the qualitative data with findings from the quantitative data permit a broader understanding of how the components within this food service systems framework interact within the context of the research question. The qualitative inquiry in this research was undertaken with an ethnographic inductive approach, which supports the accumulation of data from observation and oral or written accounts within a specific context to better understand experience and how this relates to practice <sup>(61)</sup>.

In the study of RAC food service staff, older adults with diabetes and baby boomers (chapters 7 and 9) a focus group approach was implemented and the transcripts thematically analysed. Focus

groups are a common method for understanding human experience in discussion of an issue of interest to the researcher <sup>(62)</sup>. By bringing a group of people together who are similar, in this instance who all work in an aged care setting, assisting older adults who have diabetes, group interactions and conversation can offer detailed perspectives and insight into the research topic from a real life perspective. When the research topic has a people and health focus such as this, focus groups are ideally placed to explore health needs and wants or evaluate experiences that could not be extrapolated from quantitative methods <sup>(55)</sup>. While this method is not as exhaustive as individual interviews, it offers a good introduction to the perceptions and understanding of diabetes management and how this might influence practice <sup>(53, 55)</sup>. A limitation of this approach is the risk of researcher bias or coercing the focus group to obtain a desired response <sup>(53)</sup>. Therefore, a standardised methodology was used for each focus group and analysis to maintain objectivity.

One of the benefits of thematic analysis of focus group transcripts, is its flexibility as an analytic method and can be considered a foundational method for qualitative analysis <sup>(63)</sup>. While qualitative methods have a long history in health research, thematic analysis became recognised as a method in its own right, in the 1970s <sup>(64)</sup>, with more consistent and rigorous use across many health disciplines often referencing the publication by Braun and Clarke, '*Using thematic analysis in psychology*' (2006) <sup>(63)</sup>.

Thematic analysis reports on the experiences and realities of participants collected from either interviews or focus group dialogue, and can '*acknowledge the ways individuals make meaning of their experience, and, in turn, the ways the broader social context impinges on those meanings...*' (Braun and Clarke, 2006) <sup>(63)</sup>. Using this method within datasets, patterns or over-arching themes can be proposed and a meaning interpreted. The qualitative studies discussed in chapters seven and nine both employ thematic analysis as a method. In a focus group approach using the Braun and Clarke approach (2006) which outlines six steps of analysis as guidance <sup>(63)</sup>. The six steps for analysis included;

1. Familiarisation with the data
2. Generating initial codes to organise the data
3. Searching for topics
4. Reviewing the topics / collapsing into themes

5. Defining and naming the themes
6. Producing written analysis of the study results.

Steps four and five were achieved in consensus with a second researcher (KW) after independent coding and subsequent discussion and refinement, to add further rigour to this method.

Transcripts were inductively analysed, meaning no preconceived themes were applied to the analysis and instead the themes were permitted to emerge during the coding process <sup>(65)</sup>. The goal of this approach was to understand staff knowledge and experience of diabetes and diet and how this may have been impacting their interactions with older adults with diabetes in RAC within the context of meal provision.

In contrast, observation studies are often used in qualitative research to find out more about behaviours and interactions in the natural setting being investigated <sup>(66)</sup>. Qualitative observation differs from the clinical observation of a patient that might be more usual to dietetic practice. In particular the research does not take place in an experimental setting and while comments and behaviour are documented it is in the form of field notes interpreted by the researcher rather than a verbatim transcription as used in the former study (chapter seven). The analytical process in observation studies starts during the data collection, where descriptive field notes of events do not offer as much explanation as they do where the researcher has begun to make sense of the event or interaction observed <sup>(66)</sup>.

Observation can be conducted covertly or as a participant of the activities being observed, however this presents ethical issues regarding people not able to consent to study participation <sup>(53)</sup>. In this study of mealtime practices, the approach of 'overt research' was undertaken, with all residents and staff being approached for consent to be observed and given the opportunity to decline without reason or consequence. Limitations of this approach is the risk of behaviour being modified however efforts were undertaken to manage this bias and will be discussed more fully later in this section and again in the discussion. Thematic analysis of field notes was again employed as a method in this study and is discussed more in chapter eight. Rigour of this method relies on the truthful and detailed systematic account of events which communicates the culture of the setting <sup>(66, 67)</sup>.

As with all research, it is important to maintain objectivity, but it is of particular importance in qualitative data collection to recognise how personal interactions with the studied cohort and

prior knowledge which might influence the obtaining of, or interpretation of results and subsequent bias this might create. While the data was inductively analysed, there was preconceived motivations for collecting the data, as there is for most research. Steps were taken to enhance reliability of the data and reduce bias, and this is discussed in the relevant chapters. Inductive analysis allows the data to generate themes or theories as opposed to analysing data with a preconceived theorem. The methods, their strengths and weaknesses are discussed more fully within the respective chapters. However, it is with this in mind that it is important to discuss my position as the researcher before discussing the strategies employed to manage author bias.

## **2.2 The Position of the Researcher**

The original research questions on which this thesis are based came about from my experience working as a dual qualified diabetes educator and dietitian and subsequently moving into a teaching role with a specific focus in the food service dietetics domain for several years. Time spent in these roles highlighted a lack of evidence based guidance for menu design in RAC and community food delivery services; and particularly a lack of knowledge around changes in diabetes management since the introduction of a liberalised diet in such institutions <sup>(68, 69)</sup>. I observed that approaches to menu planning for older adults with diabetes in RAC and those living in the community were at conflict with each other: which was creating confusion amongst the ageing community with diabetes, and staff in RAC supporting residents with diabetes.

In addition, experience working with older adults with diabetes has further exposed me to variation in practices both in the community and in RAC. It should be noted that I also have clinical knowledge and experience of the risks and prevalence of protein-energy malnutrition in RAC and the strong rationale this has provided for recent changes in dietetic practice in aged care. This thesis does not aim to take away from the importance of managing undernutrition malnutrition, but does aim to highlight the 'other ~50%' of residents who may be maintaining or gaining weight in RAC. In my clinical and food service experience, regular monthly weight review meetings were increasingly highlighting an under-acknowledged population of overweight residents in RAC or residents experiencing unintentional weight gain. Weight gain in these individuals was not a priority for dietetic assessment despite carers and nurses being aware of the quality of life issues for these residents e.g. reduced mobility and independence and subsequent impact on health outcomes such as glycaemic management.

It is because of this knowledge and prior exposure to the subject matter that maintaining objectivity was considered extremely important throughout all of the studies included in this thesis. Strategies such as a second independent reviewer of the literature for the systematic review and two independent theming's of focus group transcripts and observation study field notes were employed to manage risk of bias in the interpretation. Where quantitative data was collected, statistical analysis was used to identify significant findings; the results of which determined interpretation of the data. As previously mentioned, thematic analysis of qualitative data was conducted with an inductive approach. Theming was strongly associated with the data, rather than the data being searched for preconceived codes and themes. While prior knowledge can be seen as a limitation it can also be viewed as beneficial; firstly in prior experience identifying a gap in knowledge and a need for the research to be conducted. But also in the application of vocational skills such as active listening, interviewing and paraphrasing used in dietetic counselling: which lend themselves easily to qualitative interviewing and research design. To enhance the rigour of the subsequent studies and increase opportunity for peer review and publication, each study has been carefully constructed to promote reliability of results, to have a robust study design and relevance in the findings to the research question and outcomes for practice.

## **2.3 Summary**

In this thesis, quantitative methods have been employed for the critical appraisal of evidence underpinning current practice and best practice guidelines (chapters three and four), as well as exploration of current practices and cohort demographics (chapters 5 and 6) through use of a web survey and retrospective audit. In the final three chapters of this thesis, qualitative methods utilising focus groups and an observational study will be discussed. The final three chapters were informed by the preceding chapters findings, however it was intended that the qualitative studies would also elaborate on quantitative findings. These chapters intended to understand what awareness of change food service staff have, and how their own health beliefs that might influence practice (chapter seven) before an observations study examined the impact of these findings in practice (chapter eight). Finally, further focus groups probed the lived experience of dietary management of diabetes for older adults with diabetes in RAC as well as perceived needs and wants of prospective users or 'baby boomers' (chapter nine). All of the findings were interpreted within the framework of a food systems model based on the revised PROTEC model by

Lengyel et al<sup>(38, 39)</sup> and key findings summarised and discussed in relation to each other in chapter ten.

The individual methods for each study are discussed in the relevant chapters, with each being a stand-alone study but lending themselves to comparison and which cumulatively add wider meaning and context to the overarching research topic and title of this thesis, *The discordance between policy and practice in the dietary management of diabetes in RAC*. New knowledge generated from this thesis is intended to contribute to the rationale for future practice based recommendations for diet and diabetes management in RAC.

The next chapter is the first of two, looking at the 'controlling factors' or policies and guidelines that relate to the dietary management of diabetes in older adults, particularly with reference to the RAC setting. These chapters aim to explore recommendations from international sources as well as local documents. Chapter three identifies what literature may be drawn on to inform future guidelines but also the changes that have already occurred to diabetes management in older adults. Chapter four scopes and summarises the best practice and clinical guidelines that have been developed as a result. Both chapters also offer more contextual information on the dietary management of diabetes.

## **CHAPTER THREE - SYSTEMATIC REVIEW OF THE EVIDENCE FOR A LIBERALISED DIET IN THE MANAGEMENT OF DIABETES MELLITUS IN OLDER ADULTS RESIDING IN AGED CARE FACILITIES**

This chapter contains material from:

Farrer O, Yaxley A, Walton K, Healy E, Miller M. Systematic review of the evidence for a liberalised diet in the management of diabetes mellitus in older adults residing in aged care facilities.

*Diabetes Res Clin Pract.* 2015; 108(1):7-14.

(OF was the primary author of this paper and led the development of the research question, data collection, synthesis and drafting of the manuscript: parts of which are integrated into this chapter. EH assisted only with the secondary data extraction. MM, AY & KW assisted with supporting OF as PhD supervisors in conducting the review and offered comments and editing of the cited paper)

### **3.0 Overview**

The rationale and methodological approach used in this research has been set out in chapters one and two. Chapter three aims to provide an overview of diabetes diagnosis and dietary management, including the discordance between traditional management approaches, advice to older adults in the community and recommendations for those individuals in RAC. This chapter will then present the findings of a literature review conducted to explore the liberalised dietary management of diabetes for older adults. The review was conducted systematically to best capture all available and relevant studies; as well as being a robust methodology systematic reviews are widely accepted as a core component in the development or review of evidence based practice guidelines<sup>(70, 71)</sup> which will be further discussed in chapter four.

### **3.1 Background**

In 2013 worldwide prevalence of diabetes mellitus among adults aged 50 – 79yrs accounted for approximately 16% of the global health expenditure, or \$4000 (AUD) per person in Australia and New Zealand as seen in Table 1. A recent analysis of the Australian diabetes, obesity and lifestyle study also known as the ‘AusDiab’ study, has suggested that the total direct cost for diabetes in

Australians aged  $\geq 30$  years was \$4.8 billion, with an extra \$7.6 billion being spent as government subsidies <sup>(72)</sup>.

Table 1- Annual diabetes related health expenditure per person, in Australia

	Type 1 diabetes	Type 2 diabetes
No complications of diabetes	\$3,468	\$4,025
Microvascular complications only	\$8,122	\$7,025
Macrovascular complications only	\$12,105	\$9,055
Micro- and macrovascular complications	\$16,698	\$9,645

Populations throughout the world consistently show an increase in prevalence of diagnosed and undiagnosed diabetes with increasing age <sup>(30)</sup>. In Australia, in the age group 25-34 years old, 0.2% are known to have diagnosed, and 0.1% have undiagnosed diabetes, increasing to 9.4% diagnosed and 8.5% undiagnosed in 65-74 year olds and 10.9% and 12.1% respectively for people aged 75 years and older <sup>(73)</sup>. As people with diabetes age, the condition becomes an independent risk factor for entry into RAC and is associated with more falls and hospital admissions due to diabetes complications than for older adults without diabetes <sup>(74)</sup>. Already in RAC we know that up to a quarter of residents have diabetes <sup>(75-77)</sup>. The International Diabetes Federation (2013) state that *“it is increasingly important that modern recommendation for managing diabetes are more closely aligned with additional individual characteristics such as functional status, presence of frailty and dependency, comorbidity profiles, and life expectancy”*, <sup>(2)</sup>. However this is challenging in that specific evidence based guidelines for older people with diabetes are limited by a lack of clinical studies in this population group. Instead evidence is usually extrapolated from studies in younger adults with diabetes.



### 3.1.1 Diagnosis of diabetes

Diagnosis of type 2 diabetes can be initiated in a number of ways and frequently formal testing can be prompted by irregular fasting glucose results in routine blood tests and/or presence of symptoms such as:

- Excessive thirst (polydipsia),
- Frequent urination (polyuria),
- Waking at night to urinate (nocturia),
- Weight loss,
- Confusion,
- Lethargy, <sup>(17)</sup>.

These symptoms are all consequences of raised blood glucose levels or 'hyperglycaemia'.

Hyperglycaemia can also manifest as symptoms in older adults such as confusion, which can exacerbate cognitive decline, falls and poor wound healing, all of which increase health costs for the individual as well as negatively impacting on their quality of life. Longer periods of up to 6 or more years of poor glycaemic management are known to influence onset of microvascular complications such as neuropathy and nephropathy. However, macro-vascular complications can occur in as little as 1-2yrs: which is of relevance to older adults in RAC where average length of stay (LOS) is ~24 months, but can be up to 5yrs <sup>(17)</sup>. In particular, hyperglycaemia over this shorter period can exacerbate comorbidities such as hyperlipidaemia and hypertension and onset of cardiovascular events: with either heart attack, or cerebrovascular accident being the main cause of death in up to 80% of older adults with diabetes <sup>(77)</sup>. There is also evidence to suggest that suboptimal diabetes management can accelerate onset of dementia <sup>(78, 79)</sup>.

It is estimated that up to a quarter of older adults in RAC have diabetes, and it is the primary reason for 12% of admissions among residents 45 to 75 years of age; with admission in younger adults often relating to pre-existing diabetes complications <sup>(80)</sup>. The prevalence of diabetes in older adults in RAC is twice as common as in the general population <sup>(51)</sup>. RAC residents frequently have higher rates of complications and as a result require 31% more hospitalisations than older adults without diabetes in RAC <sup>(81)</sup>. This figure may even be higher again as unfortunately for older adults,

many of the symptoms of hyperglycaemia may be disregarded as normal consequences of ageing, and diabetes frequently remains undiagnosed unless picked up on routine blood tests <sup>(76, 82)</sup>.

Studies that have examined diabetes prevalence in RAC settings have found much higher rates of type 2 diabetes or pre-diabetes when implementing a protocol which tests for the condition as opposed to measuring prevalence from medical records <sup>(75, 76, 82, 83)</sup>. As previously mentioned, 12.1% of people aged 75 years and older are thought to be undiagnosed <sup>(73)</sup>.

### **3.1.2 Management of diabetes**

Maintain optimal blood glucose levels is known to alleviate symptoms of diabetes and reduce the risk of complications <sup>(2)</sup>. Diet and exercise have long been seen as the cornerstones of lifestyle management of diabetes for adults, <sup>(84)</sup> with medication increasingly required as insulin resistance progresses and natural production of the hormone decreases <sup>(17)</sup>. However, typical 'lifestyle' management strategies based on diet and exercise are what have now become controversial in their applicability to older adults, particularly those in RAC. This research is particularly concerned with the dietary management of diabetes in older adults in RAC.

Diabetes Australia and the National Diabetes Service Scheme (NDSS) in Australia <sup>(85)</sup> currently promote a whole population approach to food choices for adults with diabetes. In addition to carbohydrate counting, general dietary recommendations are closely aligned with the Australian Dietary Guidelines <sup>(86)</sup> as seen in Figure 7 and particularly with reference to the statements;

- Achieve and maintain a healthy weight;
- Limit intake of foods high in saturated fat, salt and added sugar and
- Eating a wide variety of foods from all of the core food groups.

However, for older adults in RAC, who may have significant functional dependence and multiple issues that will impact oral intake, it has been questioned whether a diet consistent with the Australian Guide to Healthy Eating (AGHE) is still appropriate.



# Australian Guide to Healthy Eating

Enjoy a wide variety of nutritious foods from these five food groups every day.  
Drink plenty of water.



Figure 7 - Graphic illustration of the Australian Guide to Healthy Eating<sup>(86)</sup>

### 3.1.3 Historical dietary management of diabetes

Dietary guidance has been subject to a number of revisions since the introduction of insulin therapy in the 1920s <sup>(68)</sup> with a common theme of dietary restriction, particularly of carbohydrate up until the late 1980s, as seen in Table 2.

Table 2 – Historical Perspective of Diet Recommendations for Management of Diabetes adapted from the *Nutrition recommendations and principles of care for people with diabetes mellitus* <sup>(87)</sup>

Distribution of calories (%)			
Year	Carbohydrate	Protein	Fat
Before 1921	← Starvation diets →		
1921	20	10	70
1950	40	20	40
1971	45	20	35
1986	≤60	12-20	<30
1994	*	10-20	**
Current macronutrient distribution for optimising diets for lowering chronic disease risk, <sup>(88)</sup>			
2006	45-65	15-25	20-35**

Key: \*Based on nutritional assessment and treatment goals; \*\* less than 10% energy from saturated fat

The introduction of insulin and risk of hypoglycaemia this brought, meant that the dietary management of diabetes required a more prescriptive approach. A swap system based on a number of prescribed food serves was devised and individuals with diabetes were provided a food swap or ‘exchange’ list at the time of education <sup>(89)</sup>. Diet was effectively matched to medication regimens and individuals were counselled not to skip meals or snacks based on fixed amounts of

starchy carbohydrate foods.

The 1970s-80s brought about an increase in carbohydrate volume in the diet but dietary prescription for people with diabetes remained primarily strict adherence to carbohydrate exchanges, typically providing 3-4 serves at mealtimes (3 x day) and 1-2 exchanges for snacks (3 x day). A sample exchange list can be viewed in Appendix 1. Health care institutions also adopted this approach and facility menus were created to limit individuals with diabetes to a set pattern of carbohydrate over the day which better suited the fixed dose insulin and medication regimens.

Individuals were educated that 'simple' carbohydrates were thought to be digested more quickly which included fruit juice and sugar and were to be restricted or avoided where possible. Whereas 'complex' carbohydrates, were at the time thought to be digested slowly such as potatoes, breads and cereals. These could be included in consistent and prescribed volumes at meals and mid-meals<sup>(90)</sup>. The diet also included strict guidance for low fat content and low cholesterol foods which resulted in a caloric restriction of around 1800 kcals (7560 kJ) and was colloquially known as the 'ADA' diet or 'diabetic diet'<sup>(91)</sup>. This diet especially recommended the avoidance of sugar and foods rich in added sugar such as cordials, soft drinks, confectionary, cakes and biscuits,<sup>(29)</sup> which were believed to cause hyperglycaemia.

In the 1990s more evidence became available regarding the glycaemic response to foods. Glycemic index (GI) was identified as a measure of how quickly a food is digested on a scale of 1-100, when compared to a reference food (glucose) with a GI of 100. Foods at the lower end of the scale are more slowly digested as compared to those with a higher GI, and this has implications for how quickly a food will influence an individuals' glycaemia<sup>(92)</sup>. Through testing the GI of staple foods it was established that 'complex' and 'simple' were no longer appropriate labels for carbohydrate containing foods. This was particularly as table sugar and bread were estimated to have similar glycaemic effect with GI ratings of 65 and respectively 68 (moderate GI) but foods like potato were rated as a rapidly digested food (GI 85) as seen in Figure 8. The glycemic index highlighted that a number of factors impact the glycaemic effect of food and these included such as their chemical structure, how refined a product is as well as their acidity, fibre or fat content<sup>(93)</sup>.

# The Glycemic Index

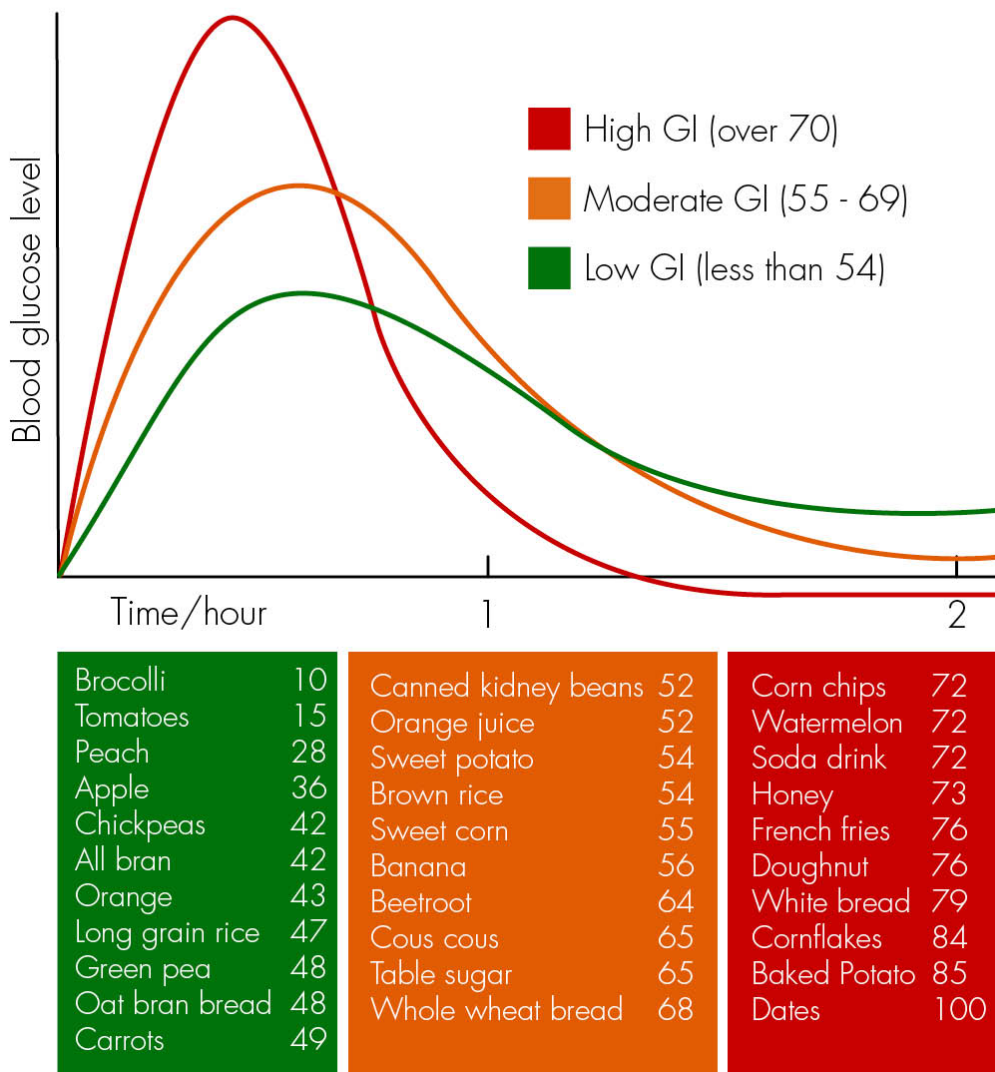


Figure 8 - An overview of glycemic index ranges and typical foods for low, moderate and high GI foods <sup>(92)</sup>

Diabetes education therefore began incorporating advice for including low GI (slowly digested) foods at each meal <sup>(94)</sup> as a means to regulate diabetes glycaemic control. The dietary prescription began to relax and sugar avoidance became less of a focus in education, although recommendations that discretionary items (confectionary, soft drink, cakes, biscuits and desserts) should not to be included regularly remained <sup>(86)</sup>. Instead individuals were taught about the glycemic index (GI) of foods <sup>(94)</sup> within a healthy eating diet. Carbohydrate counting briefly fell out of use in diabetes education for a period, but when reintroduced was used more to enhance flexibility in dietary choices rather than as a prescriptive measure for most people with diabetes.

Although carbohydrate counting had been around in some form since the 1920s, it gained renewed interest after being used as one of the dietary interventions in the Diabetes Control and Complications Trial (DCCT) <sup>(89)</sup> and demonstrated a flexible approach to dietary management while still achieving good diabetes outcomes. Modern carbohydrate counting education can now be delivered at three levels of complexity and incorporates low GI and healthy eating education <sup>(86)</sup>. Level one is the most basic approach and focuses only on consistency of the amount of carbohydrate and on which institutional diets have typically been modelled and was the basis of education in the 1970s-80s (Appendix 1).

Level two education adds a layer of complexity and looks at relationships with diet and blood glucose levels with confounders such as medication, exercise, illness and the likely glycaemic response following changes to usual routine. This approach is often adopted for the education of people with type 2 diabetes as it permits more dietary flexibility and food choice. Younger and older adults are now typically provided this style of education for diabetes self-management <sup>(95)</sup>. Programs such as the 'Diabetes Education and Self-Management for Ongoing and Newly Diagnosed' (DESMOND) <sup>(96, 97)</sup> use this approach for a more 'normal' style of eating including food choices that may have 'added' sugar, providing total carbohydrate is counted using exchanges and balanced over the course of the day to maintain optimal glycaemia <sup>(89)</sup>. Many dietitians use this concept in their education with clients and it is promoted in materials produced by Diabetes Australia and the NDSS <sup>(89, 95)</sup>. A sample of current dietary information using exchanges is included in Appendix 2 and outlines how food swaps can be made to balance intake over the day. Carbohydrate exchanges at this level are typically food serves all containing approximately 15g of carbohydrate, although the use of approximate values does permit some fluctuation day to day while still providing good glycaemic management <sup>(98)</sup>.

Level 3, the more advanced level of carbohydrate counting can be taught using more precise 10g portions of carbohydrate and are commonly used in 'Dose adjustment for normal eating' (DAFNE) programs for management of type 1 diabetes <sup>(99, 100)</sup>. DAFNE is considered a more complex level of carbohydrate counting and is generally only taught to people with type 1 diabetes using long and short acting insulin therapy or insulin pumps. Although modified DAFNE can be taught to people with type 2 diabetes, on multiple dose insulin regimens. This approach requires more precision as with Level 3 carbohydrate counting it is designed to facilitate self-titration of short acting insulin to 'match' the carbohydrate load being eaten. The relatively recent introduction of insulin pumps can

permit even more precise calculation of insulin to carbohydrate ratios. In these scenarios individuals may also be taught to read food labels or use carbohydrate counters to identify exact volumes of carbohydrate in the serves they want to eat subsequently titrate and match their insulin against. Appendix 3 provides an example of written level 3 carbohydrate counting education that might be provided to a person with type 1 diabetes.

This approach permits a more relaxed eating pattern again, allowing for fluctuating carbohydrate content of meals depending on appetite and eating occasion which could extend to omitting carbohydrate at mealtimes if wanted <sup>(100)</sup>. This may be a novel experience for many people diagnosed with diabetes prior to this technology becoming available and less common in our current older adult population in RAC (>85yrs). However, looking to the future it is likely that an increased number of older adults will enter RAC with knowledge of carbohydrate counting and insulin titration or wearing an insulin pump and be accustomed to the dietary freedom that this affords them.

### **3.1.4 Changes in practice**

Until fairly recently dietary management of diabetes in older adults has been consistent with advice given to adults with diabetes under 65 years of age, and aligned with traditional healthy eating principles as set out in the Australian Dietary Guidelines <sup>(86)</sup>. This diet is known to assist in weight management and in achieving optimal glycaemic management of diabetes <sup>(101)</sup>. Thus reducing the risk of diabetes complications as well as being appropriate for management of associated comorbidities such as obesity and cardiovascular disease <sup>(102, 103)</sup>. However while this approach is still deemed valid for functionally independent older adults <sup>(2)</sup>, there is consensus driving RAC menu policy that it is less appropriate for older adults with diabetes <sup>(34, 68)</sup>. Instead, dietary liberalisation has been proposed for all older adults, but particularly those in RAC and weight loss is discouraged for fear of exacerbating protein-energy malnutrition and poor quality of life <sup>(27, 104)</sup>.

### **3.1.5 The diet and diabetes controversy**

As discussed, diet is a cornerstone of optimal diabetes management. Lifestyle factors such as a healthy diet, exercise and modest weight loss of 5-10% if required, have well documented benefits in improving insulin sensitivity and glucose uptake <sup>(105)</sup>. However, for older adults residing in RAC it



is impractical to expect regular exercise. In addition, weight loss of >5% without adjunct physical activity to preserve lean body mass <sup>(104, 106)</sup> can actually have a negative impact on mortality <sup>(107)</sup>, which realistically leaves diet and drug therapy to manage glycaemia.

Over prescribing or multiple medications also referred to as 'polypharmacy', is highly prevalent in older adults. Data suggests that older adults 80 years and over, most likely have at least three chronic conditions one of which is typically diabetes <sup>(74)</sup>. The presence of this multi-morbidity impacts on quality of life and is associated with high economic burden <sup>(74, 108)</sup>. A review by Stewart et al (2017) notes that for older adults with two or more chronic conditions they could expect to be on 4-9 different medications, with the number increasing with age <sup>(74)</sup>. Polypharmacy carries risk of drug interactions and negative side effects affecting mobility and in particular risk of hypoglycaemia or low blood sugar levels <sup>(109)</sup>.

It is in consideration of these risks that treatment options for diabetes management are often a trade-off between benefits and potential for harm <sup>(109)</sup>. This approach may result in some physicians being more conservative in their prescribing of diabetes medications to manage hyperglycaemia (high blood sugar levels) whereas others may overprescribe. The literature supports that older adults with diabetes are frequently either over or under-medicated in relation to their diabetes <sup>(74, 110-113)</sup>. While hypoglycaemia can result in falls and worst case scenario – coma and death, hyperglycaemia is also not desirable. The economic cost savings and improved quality of life for optimal glycaemic management in older adults with diabetes have been stated as a benefit to residents and health care providers. It is clear that there is some benefit for the older population to adopt or maintain health promoting behaviours, including a diet (whatever that may look like) that may prevent or postpone complications where this could have a significant effect on quality of life, morbidity and mortality<sup>(114)</sup>. What is contentious in the literature is how much these benefits still apply to older adults in RAC facilities.

There is concern that institutionalised older adults may have more significant acute and/or chronic health issues which may predispose this cohort to protein - energy malnutrition, rather than health concerns related to over-nutrition <sup>(29, 68)</sup>. Acute and chronic health conditions, medication side effects and mechanical problems affecting chewing, swallowing and self-feeding; and psychosocial concerns such as feelings of isolation and depression can all impact on the desire and ability to eat. Independently or together these issues can all contribute to the risk of

undernutrition<sup>(22)</sup>. Malnutrition in the form of undernutrition, or inadequate protein and caloric intake, affects both the physical health and mental health of individuals. Current prevalence rates suggest that up to 50% of older adults in RAC are malnourished<sup>(33)</sup> and that older adults on restrictive diets may be even more so at risk<sup>(68, 115)</sup>. Subsequently, dietary liberalisation has been proposed for all older adults in RAC on restrictive therapeutic diets, such as those with diabetes. The liberalised diet has not been well articulated in composition within the literature other than removal of ‘no added sugar’ orders and caloric restriction, thereby offering the same diet to all residents and individualising where appropriate<sup>(29, 68)</sup>. There is therefore potential for the liberalised diet to be at conflict with medical nutrition therapy of diabetes.

The IDF global guideline and physician guidelines for managing diabetes in older adults support that risk factors for chronic disease complications remain influential and modifiable<sup>(2)</sup>. The guidelines propose that even an older age group of individuals 85 years and over the immediate benefits of optimal glycaemia associated with improved quality of life outcomes are not to be devalued<sup>(2, 17)</sup>. It was therefore important to identify and evaluate the evidence in support of a liberalised diet for diabetes management in this cohort.

### **3.2 Research Question**

What evidence is there to support a liberalised diet for diabetes management in older adults?

### **3.3 Methods**

A systematic review of the literature studying the effects of either a therapeutic diet or liberalised diet on diabetes management in RAC facilities was completed. An extensive three step search of relevant databases with no restriction on date of publication was carried out. The initial search was conducted using keywords in either the abstract or title of articles found via Pubmed and CINAHL databases. Following this was a more detailed search of all key words including MESH headings in MEDLINE, Cochrane, Informit, Web of Science, Scopus and AgeLine databases was conducted (Table 3). The full search strategies are included in Appendix 4. Finally, reference lists of all articles were reviewed for papers of interest that had not already been identified. This search has been run again since the initial findings were published<sup>(116)</sup>, most recently on 17<sup>th</sup> January 2018.

Primary outcome measures included HbA1c (%), fasting or post prandial BGL's (mmol/L), BMI (kg/m<sup>2</sup>) or weight change (kg) in participants with diabetes mellitus residing in an aged care facility. Secondary outcomes for nutritional status included albumin and measures of oral intake or appetite as well as change in comorbidity risk factors such as total cholesterol. Observational data for one diet type, was acceptable provided the participants were in an aged care setting, had a diagnosis of diabetes mellitus and outcome measures were commented on in comparison to existing data or literature in the event of no control group. Inclusion criteria were that studies were set in an aged care facility, reviewed the effect of a diet (whether liberalised or therapeutic) and its effect on diabetes management in older adults with a mean age of ≥65years.

The initial search was conducted by the PhD candidate (OF), but a second researcher assisted with the screening of results once duplicates had been removed. Final screening of the reference lists and data extraction from identified papers was completed by both researchers independently and where discrepancies occurred a third person was consulted. Of the six <sup>(32, 51, 83, 111, 117, 118)</sup> studies included one was published in Spanish <sup>(117)</sup> with no English translation, but due to the limited literature available and relevancy of the outcomes it was translated by the researcher and included. The second more recent search (2018) yielded no new studies.

Table 3 – List of keyword and MESH search terms

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(nursing home\* OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR aged care facilit\* OR care home\* OR "residential care" OR institutionalized elder\* OR institutionalised elder\* OR institutionalized older adult\* OR institutionalised older adult\* OR skilled nursing facilit\* OR (resident\* AND dementia) AND (diabet\* OR NIDDM OR IDDM OR T1DM OR T2DM) AND (diet\* OR "nutrition therapy" OR nutritional therap\* OR menu\* OR food service\*)

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The quality of each article was assessed using the Jadad scale <sup>(119)</sup>, reviewing risk of bias using a points system based on cohort selection, blinding and attrition and the detail in which these are described. A final score of 0-5 is awarded, with 5 being of the highest quality (Table 4).

Table 4 - Quality assessment of studies included in the review according to the Jadad scale <sup>(119)</sup>

Author, year	RCT	Blinding	Attrition	Randomisation method	Blinding method	Total Score
Bouillet B. et al, 2010 <sup>(111)</sup>	0	0	0	0	0	0
Coulston A. et al, 1990 <sup>(32)</sup>	0	0	0	0	0	0
Tariq S. et al, 2001 <sup>(51)</sup>	0	0	0	0	0	0
Casimiro C et al, 2001 <sup>(117)</sup>	0	0	1	0	0	1
Cooper J et al, 1990 <sup>(83)</sup>	0	0	0	0	0	0
Goldberg D. 2003 <sup>(118)</sup>	1	0	0	1	0	2

### 3.4 Results

A total of 1548 studies were identified from the initial search in 2014 and subsequent search in 2018, with an additional 12 from hand searching references lists. After removing duplicates (n=445) this left 1115 records to be screened. From this review of the titles and abstracts 1107 references were discounted as not meeting inclusion criteria for reasons such as; non-human studies, drug trials, narrative articles and diabetes position statements, which left 8 full papers to retrieve (Figure 9).

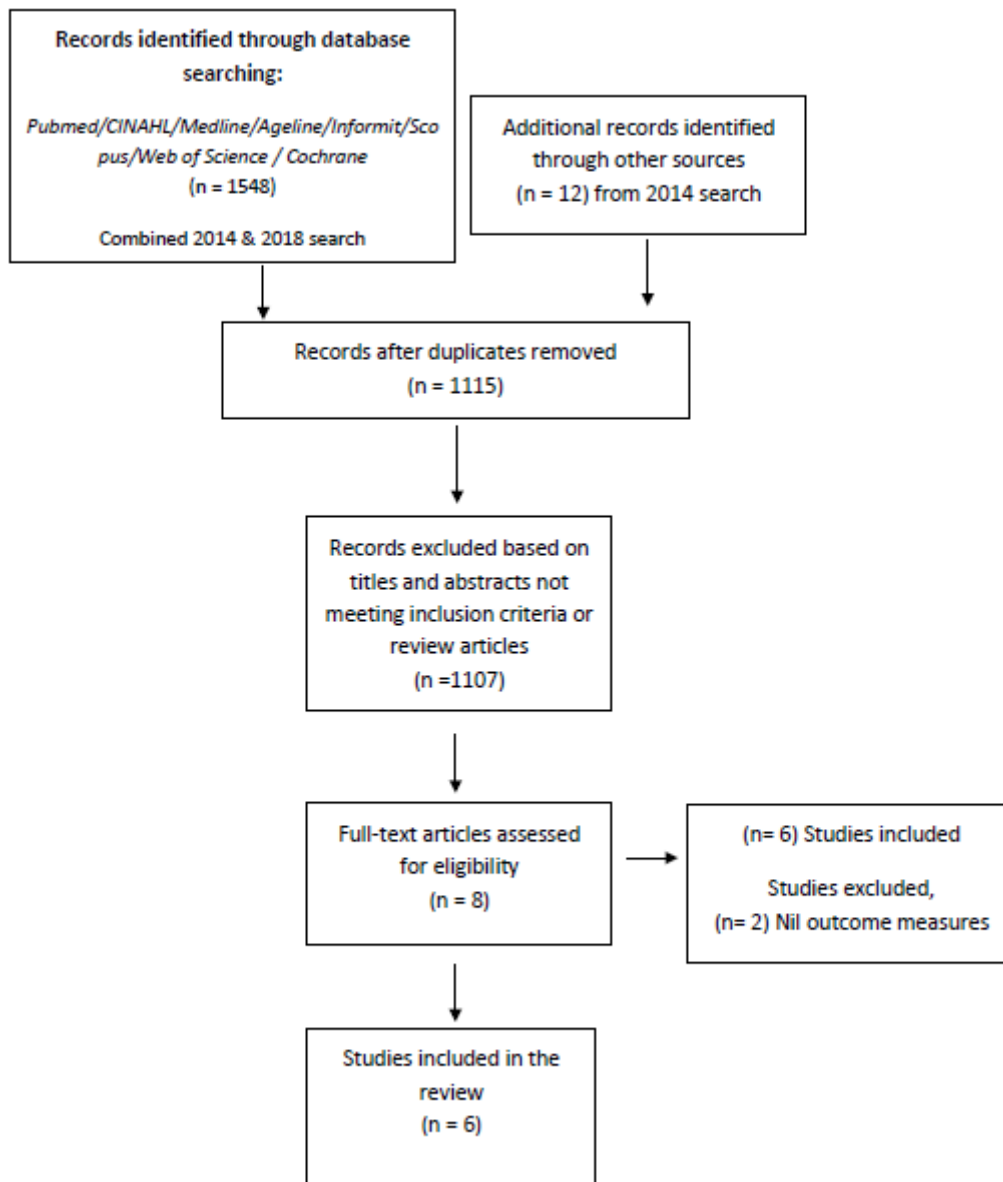


Figure 9 - Study flow diagram showing the number of studies screened, assessed for eligibility and included in the review of a liberalised diet for older adults with diabetes

Two of these did not meet the inclusion criteria following full text review <sup>(120, 121)</sup> because primary and secondary outcome measures were not discussed. Table 5 summarises the study design, outcomes and findings for the six included studies, one of which had to be translated from Spanish <sup>(117)</sup> and the sixth included study was a thesis <sup>(118)</sup>, the full manuscript was received from the author with permission for use.

Table 5 - Summary of studies that examine a relationship between diet and diabetes management, nutritional status and comorbidity risk factor outcomes

Authors	Study Design	Sample	Outcomes as Measured by:			Summary of Findings (results data presented in Table 6)
			Glycaemia	Nutritional status	Comorbidity risk factors	
<i>Goldberg B. (118) (2003) USA</i>	Randomised controlled trial, 12 weeks liberalised diet compared to residents current 'no sweets' diet, follow up over 16 weeks	34 RAC residents with type 2 diabetes usually receiving a therapeutic diet	Baseline HbA1c and Fasting BGL's	%IBW at baseline  Albumin at baseline	Nil	Liberalised diet did not significantly affect glycaemia or nutritional status.
<i>Coulston A. et al. (32) (1990) USA</i>	Non randomised controlled trial, therapeutic diet liberalised for 8 weeks. Follow up over 16 weeks	18 T2DM RAC residents ≥70yrs usually receiving therapeutic diets	Fasting BGL's HbA1c	BMI	Triglyceride Cholesterol	Liberalised diet increased calorie intake with modest effect on diabetes management but authors argue that there is more positive gain to patient not to be restricted
<i>Tariq S. et al. (51) (2001) USA</i>	Non-randomised controlled trial, therapeutic diet liberalised for 12 weeks. Follow up over 6 months	28 RAC residents with T2DM. Non acute issues and able to self-feed usually receiving therapeutic diets	Baseline, 3 months and 6 month HbA1c & Baseline, 3 month fasting BGL's	Baseline and 3 month weight, BMI & Albumin	Nil	No significant changes in glycaemia or nutritional status. Authors conclude that a liberalised diet including sucrose containing foods should be recommended.
<i>Casimiro C et al (117) (2001) Spain</i>	1 day cross sectional survey of residents provided a therapeutic diet (n=394) in aged care facility as compared to those receiving a liberalised diet (n = 92)	486 older adults residing in RAC, with non - complicated type 2 diabetes	Glycaemic control	Weight BMI  Satisfaction with diet	Total cholesterol	Residents on a therapeutic diet demonstrated better glycaemic management independent of age and physical ability and were happy with food choices. Therapeutic diet did not affect appetite, intake or malnutrition risk and may support best diabetes management.
<i>Bouillet B. et al, (111) (2010) France</i>	Retrospective cross sectional study of residents receiving a therapeutic diet (n = 54) compared with a liberalised diet (n=46). Data collected on 1 occasion	100 participants with diabetes ≥65yrs old Across 7 institutions	HbA1c	BMI Albumin	Total Cholesterol Triglycerides	Study shows no significant change in glycaemia, nutritional status or risk factors between diets
<i>Cooper, J. et al (83) (1990) USA</i>	1 day Retrospective observation study of aged care residents with diabetes.	41 Residents of aged care facility >36months with type 2 diabetes	Fasting BGL's	%IBW	Nil	Those residents receiving a therapeutic diet and also overweight were deemed non-compliant with diet as no significant changes in weight. Overall mortality was similar between groups but hospitalisations were more frequent in those with diabetes.

### 3.4.1 Effects of intervention on glycaemic management of diabetes

Of the included studies, five <sup>(32, 51, 111, 117, 118)</sup> compared the effects of a liberalised diet compared with a therapeutic diet on glycaemia in RAC residents with type 2 diabetes, based on outcomes mean (SD) HbA1c (%) and/or mean (SD) fasting blood glucose levels (BGL's, mmol/L,) as illustrated in Table 5. Although not explicitly quantified, the liberalised diet was characterised by removal of caloric and added sugar dietary restriction, with residents receiving the same standard menu as their peers. Menus were therefore variable between studies and RAC sites within studies. All three controlled trials <sup>(32, 51, 118)</sup> evaluated change in glycaemia over an 8-12 week period; providing baseline and end of intervention data. In two <sup>(111, 117)</sup> of the cross sectional studies data for HbA1c (%), as a mean (SD) value, for both therapeutic and liberalised diet cohorts was commented on from one off medical record data collection. The sixth study <sup>(83)</sup> included in the review, made no direct evaluation of a diet comparison but included data for fasting BGL's categorised by type of diabetes management e.g. no treatment, diet only, diet and insulin.

Of the five studies <sup>(32, 51, 111, 117, 118)</sup> that commented on HbA1c (%), Casimiro et al (2001) was the only study to report a significant difference in glucose levels ( $p=0.0006$ ) in favour of a therapeutic diet ( $n = 394$ ) <sup>(117)</sup>, with facility clinicians reporting 71% ( $n=276$ ) of residents with optimal glycaemic management as compared to only 37% ( $n=34$ ) of those on a liberalised diet ( $n=92$ ). Although the four <sup>(32, 51, 111, 118)</sup> remaining studies did not observe a statistically significant change in mean HbA1c (%) when residents were provided a liberalised diet ( $n=103$ ), Coulston et al (1990) did note a moderate increase across the two RAC used for data collection ( $n=18$ ), which when broken down for one cohort at the Masonic home site ( $n=8$ ) was significant ( $p<0.05$ ).

Four studies <sup>(32, 51, 83, 118)</sup> evaluated mean fasting blood glucose levels (mmol/L) in relation to dietary management. Coulston et al (1990) noted a significant mean rise of 1.1mmol/L ( $p<0.05$ ) in BGL's over the intervention period (8 weeks liberalised diet). Similarly, Cooper et al (1990) found those residents on a liberalised diet ( $n=2$ ) when compared with those on a therapeutic diet as their only treatment ( $n=9$ ) had a higher incidence of sub-optimal fasting blood glucose levels but the sample size was small and not viable for statistical analysis; therefore limiting the conclusions that can be drawn from this study. The remaining two studies found no change over a 12 week intervention period, Tariq et al (2001) noted no significant difference in fasting levels ( $p=0.45$ ) and although Goldberg (2003) did not present data the author comments indicate that no

statistical change was observed when residents were provided with a liberalised diet ( $p=0.839$ ) as seen in Table 6.



Table 6 – Study methodology and key findings for studies evaluating effects of a liberalised diet on glycaemia

Author, year	Methodology	Sample (n)	Changes in glycaemic outcomes for therapeutic diet vs liberalised diet					
			Mean (SD) HbA1c (%)		p value	Mean (SD) Fasting BGL (mmol/L)		p value
			Therapeutic	Liberalised		Therapeutic	Liberalised	
Goldberg B. 2003 <sup>(118)</sup>	n=17 residents randomly assigned to receive a liberalised diet for 12 weeks.	34	6.5±0.88%	-	0.507	6.9±1.9	-	0.839
Coulston A. et al, 1990 <sup>(32)</sup>	n= 18 residents non randomised to receive a liberalised diet for 8 weeks	18	7.8±0.4	8.1±0.5	>0.05	6.7±0.4	7.3±0.4	<0.05
Tariq S. et al, 2001 <sup>(51)</sup>	n = 14 residents non randomised to receive a liberalised diet for 12 weeks	28	6.7±1.5	7.0±1.1	-	8.2±3.0	7.3±2.1	-
Casimiro C. et al, 2001 <sup>(117)</sup>	Questionnaire administered to physicians of RAC residents with diabetes; n=394 receiving therapeutic diets compared with n=92 on liberalised diets	486	-	-	0.0006	-	-	-
Bouillet B. et al, 2010 <sup>(111)</sup>	Data collection from medical records of RAC residents with diabetes over 7 institutions.  n=54 received therapeutic diet, n = 46 liberalised diet	100	7.26±1.36	7.11±1.10	0.27	-	-	-

Abbreviations: RAC = residential aged care

### 3.4.2 Effect of therapeutic diet on nutritional status

Five of the studies<sup>(32, 51, 111, 117, 118)</sup> used BMI or albumin as measures of nutritional status, two of which also comment on weight<sup>(117)</sup> or percent ideal body weight<sup>(118)</sup>. Only one of the intervention studies<sup>(51)</sup> evaluated a change in BMI, reporting a non-significant difference ( $p=0.64$ ) between therapeutic diet and liberalised diet cohorts at 12 weeks, despite a mean (SD) increase of  $1.2\pm 1.3$  and  $0.8\pm 0.1$  ( $\text{kg}/\text{m}^2$ ) respectively. Three<sup>(32, 111, 117)</sup> studies state mean (SD) baseline BMI ( $\text{kg}/\text{m}^2$ ) for their sample populations as between  $24.3\pm 1.0$  and  $28.5\pm 10.7$   $\text{kg}/\text{m}^2$  but did not measure change. Casimiro et al (2001) included baseline mean (SD) weight (kg) for the study cohort;  $72.8\pm 14.2$  kg men versus  $63.7\pm 13.7$  kg women, and highlighted a need to adjust for gender in statistical analysis. Goldberg (2003) did not include data for BMI ( $\text{kg}/\text{m}^2$ ) but described the %IBW of the sample as being  $124\pm 22.5\%$  and  $128\pm 24.8\%$  for therapeutic and liberalised diet cohorts respectively, with ideal weight between 90% - 120% considered healthy. The change in % IBW over the course of the intervention is referred to as non-significant ( $p=>0.05$ ) but results are not presented in the thesis<sup>(118)</sup>.

Three<sup>(51, 111, 118)</sup> of the studies identified albumin (g/L) as an indicator of nutritional status. Of the controlled trials<sup>(51, 118)</sup> Goldberg (2003) concluded no difference for either the therapeutic ( $p=0.879$ ) or liberalised diet group ( $p=0.629$ ) both of which remained within healthy parameters but had insufficient sample size to perform statistical analysis of the change in albumin levels for residents identified as malnourished at baseline ( $n=4$ ). Tariq et al (2001) saw a slight increase in mean (SD) albumin levels (g/L) for the therapeutic diet group of  $2\pm 4.0$  g/L but no change for the liberalised diet cohort ( $p=0.80$ ). Bouillet et al (2010) describes his sample population as being within normal levels for albumin.

In addition to albumin and weight change, three<sup>(32, 117, 118)</sup> of the studies compared oral intake for residents on both the therapeutic and liberalised diet and one<sup>(117)</sup> included qualitative data on resident satisfaction for each diet. Coulston et al (1990) observed a mean increase of 240 kilocalories (kcal) per day from carbohydrate and fat on a liberalised diet which was not statistically significant. Conversely, Goldberg (2003) observed no change in either the therapeutic ( $p=0.603$ ) or liberalised diet cohorts ( $p=0.845$ ) for estimated % oral intake of required calories consumed. Based on a descriptive scale and completed by the residents' physician, Casimiro et al (2001) concluded there was no difference in appetite ( $p=0.306$ ), oral intake ( $p=0.349$ ) or resident

satisfaction with the diet; with 69% of those on a therapeutic diet (n=236) versus 82% on liberalised diet (n= 75), always being satisfied with their meals ( $p=0.103$ ) and almost always eating all of their meals ( $p=0.306$ ).

### **3.4.3 Effects of a therapeutic diet on comorbidity risk factors**

Two of the studies<sup>(32, 111)</sup> made comment on lipid profiles related to residents' diet, specifically total cholesterol and triglycerides. Bouillet et al (2010) provided baseline mean values only (mmol/L) all within the normal range (<4mmol/L Total cholesterol, <1.5mmol/L Triglycerides<sup>(122)</sup>) for both therapeutic and liberalised diet cohorts. Coulston et al (1990) is the only study to compare baseline with post intervention data but also reports non-significant results. However, on closer examination of the two data collection sites, in one of the cohorts again (n=8) a modest rise in mean triglycerides (mmol/L) of  $0.3\pm 0.1$  and cholesterol (mmol/L)  $0.2\pm 0.1$  was observed whilst residents received a liberalised diet.

Aside from comorbidity risk, Cooper et al (1990) conducted data collection from medical records to review the difference in outcomes for residents with and without diabetes residing in an RAC. Residents with diabetes were defined by their treatment as either, no treatment/diet prescription (n=2), diet alone (n=9), diet and insulin (n= 25) or diet and oral hypoglycaemic agent (OHA) (n=5). Comparison of incidence of complications for those residents managed with a therapeutic diet (n=9) and those with no treatment (n=2) was not statistically viable but overall residents with diabetes, regardless of treatment, were more frequently hospitalized and those residents managed with diet and insulin (n=25) had higher incidence of both hyper and hypoglycaemia, amputation and congestive heart failure.

### 3.5 Discussion

This systematic review found a majority consensus in favour of a liberalised diet for diabetes management which the literature proposes to improve nutritional status while not impacting on glycaemic management in residents of RAC. Overall, all but one <sup>(117)</sup> of the six studies included in this review are in support of a liberalised dietary approach, but on inspection of the literature, data is limited and the overall quality is poor.

Four <sup>(32, 51, 111, 118)</sup> of the five studies commenting on glycaemic control found that there was no significant change overall in HbA1c or fasting blood glucose levels when comparing a liberalised diet to a therapeutic diet. However in the three controlled trials <sup>(32, 51, 118)</sup> there were significant limitations with study design specifically, efforts to reduce bias, small sample size ( $n < 18$ ), short duration of the studies ( $< 12$  weeks) and recruitment of healthy cohorts ( $BMI > 18 \text{ kg/m}^2$ ) with already optimal diabetes management ( $< 8\%$ ,  $64 \text{ mmol/mol}$  HbA1c) which is unlikely to accurately represent the diversity seen in aged care residents with diabetes. Similarly the cross sectional study by Bouillet et al (2010) scored poorly for study quality and although the sample size was larger ( $n=100$ ), the cohort was recruited across seven different aged care facilities, each of which offered different therapeutic and liberalised menus despite direct comparison for outcomes. Only one of the five studies<sup>(32)</sup> supporting a liberalised diet, controlled for diabetes medication dosage throughout the study whereas others noted that medication had to be increased <sup>(51, 118)</sup> during the liberalised diet intervention or was too heavily prescribed overall <sup>(111)</sup> which may have influenced glycaemic outcomes throughout.

Additionally, these studies <sup>(32, 51, 111, 118)</sup> concluded therapeutic diets were restrictive in nature and increased risk of malnutrition and affected quality of life for institutionalised older adults. However, only one study measured change in BMI <sup>(51)</sup> while on the liberalised diet with no change in outcomes. Whereas the others <sup>(32, 111, 118)</sup>, contrary to the authors' assumptions', found BMI or weight were within healthy parameters for residents already receiving a therapeutic diet as standard care. This therefore suggests that neither a therapeutic diet had negatively impacted on nutritional status nor a liberalised diet improved nutritional status.

In relation to quality of life assumptions, only one study<sup>(117)</sup> assessed patient satisfaction with diet. Casimiro et al (2001) was in favour of a therapeutic diet for diabetes management ( $n=394$ ) based

on an observed positive effect on glycaemia and qualitative findings that there was no difference in resident dietary preference or intake when compared to residents provided a liberalised diet (n=92). The author also comments that on reviewing modifiable risk factors for diabetes management and its comorbidities, it is known that weight loss is often not advisable for this population group and can even increase morbidity. Physical activity is more difficult and unlikely to be of an intensity which would benefit glycaemia and therefore the author concludes that the administration of a therapeutic diet might actually counteract a lack of exercise and benefit overall metabolic control <sup>(117)</sup>. Unfortunately the study is not without its own limitations in study design such as lack of randomisation, no reporting of reference ranges used for comparison and differences in dietary provision over multiple data collection sites with a skewed sample size in favour of a therapeutic diet. In addition data on appetite and satisfaction with meals was reported by residents' physicians and is therefore at high risk of bias.

The remaining study<sup>(83)</sup> included in this review, had inadequate data from which to draw any conclusions, as outcomes were not discussed in relation to the effects of dietary management of diabetes. Instead their findings support those in the wider literature<sup>(81)</sup> of the higher incidence of hospitalization and complications for aged care residents with diabetes, primarily related to hypo- and hyper-glycaemia and the need for optimal glycaemic management in this population group.

## **Limitations**

Overall comparison between studies was challenging as study outcomes were often not directly comparable and only three of the studies were controlled trials in design providing data for pre and post interventions implementing a liberalised diet; but even within these studies data was incomplete for primary outcomes. However, this review has confidence that the most relevant literature on this topic has been sourced including the two studies <sup>(32, 51)</sup> repeatedly referred to in the position statements from authority bodies such as the American Diabetes Association and the Academy of Nutrition and Dietetics (formerly the American Dietetic Association) <sup>(101, 123, 124)</sup>.

### 3.6 Summary

This review demonstrates the lack of robust evidence on which to base clinical guidelines for the management of diabetes in older adults in RAC. The review also raises a number of questions which have come about as a result of the assumptions made in the reviewed literature.

Assumptions include author consensus that a liberalised diet will improve quality of life and reduce risk of malnutrition despite neither of these outcomes being adequately measured. In addition, the literature describes older adults with diabetes as a high risk population (for malnutrition) but does not present this cohort in the studies. It may also be important to consider that the ageing population studied may have different characteristics to now, with potentially an increased number of older adults now entering aged care with pre-existing diabetes and obesity. The following chapters will describe the research undertaken by the candidate to explore these assumptions within the food service model discussed in chapter two.

This systematic literature review has highlighted potential limitations in the rationale for a liberalised diet in managing older adults with diabetes. The following chapter (chapter four) will examine how the evidence has been interpreted to guide practice within practitioner guidelines. Clinical guidelines are a way of benchmarking services and are a 'controlling factor' in the delivery and design of institutional food services. It was important to understand what guidance is available and how this evidence has been interpreted. Currently there are no mandatory guidelines for RAC in Australia. Instead a number of clinical or best practice guidelines can be referred to with varying applicability to older adults in institutional care. Subsequently the impact of this on other components of the food service model will be explored within the thesis.

# CHAPTER FOUR – A SCOPING REVIEW OF GUIDELINES REFERRING TO THE DIETARY MANAGEMENT OF DIABETES IN OLDER ADULTS IN RESIDENTIAL AGED CARE

## 4.0 Overview

Chapter three provided an overview of diabetes and the differences in approach to dietary management for adults, older adults in the community and older adults in RAC. Chapter three also critiqued the literature that has been used to support a liberalised diet for older adults with diabetes via systematic literature review design. This chapter now aims to identify the clinician guidelines that are widely available to guide diabetes management in older adults in residential aged care. The review will explore how a liberalised diet may be being interpreted, if at all in practice documents. In addition it will evaluate their quality and applicability to practice, while also summarising and comparing key dietary messages each guideline promotes.

## 4.1 Research Question

What international and local evidence based guidelines exist to guide the dietary management of older adults with diabetes in RAC?

## 4.2 Background

Changes to the philosophical approach, scientific recommendations and terminology in the nutritional management adults with diabetes in Australia, have come about since the American Diabetes Association (ADA) position statement ‘Nutrition Recommendations and Principles for people with diabetes mellitus’ in 1994 <sup>(125)</sup>. The paradigm of the ADA diet based on caloric restriction and prescriptive macronutrient distribution became obsolete. A new model of medical nutrition therapy that included lifestyle assessment, individualisation of metabolic parameters and nutrition goals for therapeutic outcomes was introduced <sup>(29, 125)</sup>. Particular changes to prior dietary recommendations included acknowledgement that total carbohydrate had impact on metabolic outcomes (blood glucose levels) as well as the type of carbohydrate, and therefore recommendations for fibre and sucrose (sugar) could be more aligned with those for people without diabetes <sup>(125)</sup>. Medical nutrition therapy also replaced traditional terminology ‘diet therapy’, and self-management training replaced patient education. While the diet was

recommended to be liberalised from previously restricted macronutrient recommendations, individuals were encouraged to maintain a consistent carbohydrate eating pattern proven to lower glycated haemoglobin (HbA1c) <sup>(125, 126)</sup> and using carbohydrate counting to enhance dietary flexibility.

In 2002, the ADA commissioned a taskforce to again review the evidence for medical nutrition therapy and the dietary management of type 1 and type 2 diabetes <sup>(115)</sup>. This was the first document to include a brief section on special considerations for older adults, with all prior dietary advice being aligned with generic adult (18-64 years) recommendations. The core dietary recommendations for the inclusion of wholegrains, adequate fruit and vegetable serves and low glycemic index (GI) foods remained the same for all people with diabetes and similar to healthy eating documents applicable to the wider population <sup>(85, 86)</sup>. In addition, it was again reinforced that sugar in the diet could be included without restriction but it was recommended that foods with added sugar, *“should be substituted for other carbohydrate sources or covered with insulin or glucose lowering medication”* <sup>(115)</sup>. The specific guidance aimed at older adults in this document was based on expert consensus only and stated, *“In the elderly, undernutrition is more likely than over nutrition and therefore caution should be exercised when prescribing weight loss diets”* <sup>(115)</sup>.

The Academy of Nutrition and Dietetics (AND) also released a position statement (2002) supporting the liberalisation of therapeutic diets for adults with diabetes and highlighted two goals of care for older adults; maintenance of health and maintenance of quality of life <sup>(68)</sup>. Their interpretation of a liberalised diet was also a regular diet with no restriction of food choice to promote oral intake and minimise risk of malnutrition in this cohort. However the document highlighted the need for reinstatement of a more *‘controlled diet if individuals do not tolerate dietary liberalisation’* <sup>(68)</sup>.

Since their release, ADA updates have been conducted and published as medical care standards and position statements (generally updated every 5 years) with minor changes <sup>(101, 123, 127-137)</sup>. Academy of Nutrition and Dietetics (AND) have also updated their position statements, but with less frequency <sup>(138, 139)</sup>. Dietary recommendations for older adults particularly those in RAC, remain broad in nature in Australia and America. Although the UK has maintained a more consistent approach in maintaining the same advice for adults as older adults in the dietary management of diabetes which is reflected in their Diabetes UK endorsed guidelines <sup>(140)</sup>.



At the present time there is no one document mandated for use within Australia, but a number of best practice guidelines have been locally developed <sup>(34, 141)</sup>, and international clinician guidelines <sup>(2, 30, 142)</sup> are available for the general management of older adults with diabetes. However, most are not widely known about by health professionals working in aged care and older adults with diabetes <sup>(143)</sup> or are used ad hoc. This chapter aims to address the second research objective in this scoping review; to identify what local and international guidelines are available for the management of older adults with diabetes and to what extent they refer to management of older adults in RAC. Unlike in a literature review where information is synthesised and answers a research question, the scoping review aims to identify what guidelines exist and how the evidence identified in chapter three is manifesting in these guidelines for the nutrition management of diabetes in older adults. The scoping review will aim to compare key nutrition messages, and appraise the guidelines to determine their quality and applicability in guiding future best practice management of diet and diabetes in older adults, particularly those in a RAC setting.

### 4.3 Methods

A targeted electronic database search, online grey literature search and hand searching of reference lists was conducted by the candidate. The database search was conducted in Medline (via Pubmed) and Cumulative Index of Nursing and Allied health literature database (CINAHL) with no restriction on dates. Search strings were developed and used for database searching (Table 7) with a more simplistic key word search in Google Scholar. The first 10 pages of grey literature (100 results) were reviewed for relevance, with no relevant documents being retrieved after the first five pages. In addition, professional societies such as diabetes and dietetic associations in the UK, United States of America (USA), Australia and New Zealand were searched for guidelines related to older adults with diabetes.

Table 7 - List of Keyword and MESH search terms for a scoping review of dietary guidelines for the management of older adults with diabetes

(nursing home\* OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR aged care facilit\* OR care home\* OR "residential care" AND institutionalized elder\* OR institutionalised elder\* OR institutionalized older adult\* OR institutionalised older adult\* OR skilled nursing facilit\* OR resident\* AND (diabet\* OR NIDDM OR IDDM OR T1DM OR T2DM) AND (diet\* OR "nutrition therapv" OR nutritional therap\* OR menu\* OR guide\*)

### **4.3.1 Data screening**

Titles and abstracts of each reference retrieved were reviewed and final eligibility was determined by screening of full texts based on inclusion criteria. Essential inclusion criteria were that the document was written as best practice guidelines (excluding position statements) and was particularly focused on diabetes management in older adults (although this could be limited to a section of the document) and ideally referring to an aged care setting, at least in part. Finally the documents needed to be written in English. This methodology was modelled on the Joanna Briggs Institute (JBI) manual for scoping review methodology (2015) <sup>(48)</sup>.

### **4.3.2 Data extraction and quality appraisal**

Data extracted included year of publication, authors and their profession, guideline goals and key nutrition messages from included documents and were entered into an excel spreadsheet. The quality of each guideline was determined using the Agree II- Global Rating scale (Agree II-GRS) instrument. The original Agree II tool for appraising guidelines is an internationally recognised tool for determining guideline quality <sup>(144)</sup>. The Agree II-GRS is the short item tool for rapid review, but is recognised as an acceptable critical appraisal tool for clinician guidelines <sup>(145)</sup>. The tool appraises the guidelines methodology, scope, quality and applicability to practice with a final section relating to the overall quality of the guidelines. In testing the reliability of the Agree II-GRS, final scores have been found to highly correlate with scores generated from the full Agree II tool particularly for guideline evaluation <sup>(145)</sup>. Therefore the short form tool was deemed appropriate for use in this review.

## **4.4 Results**

A total of 185 references were retrieved from all steps of the search strategy, with 165 remaining after 20 duplicates were removed. A further 144 were excluded after screening of their title and abstract and which did not meet inclusion criteria. Of the remaining 21 references and following full-text screening, 10 were excluded on the basis of not being guidelines or a more recent version was available. Therefore 11 documents were included in the critical appraisal having met all inclusion criteria. Full details of the search are provided in Figure 10.

Of the documents retrieved, three were specifically written to guide the dietary management of older adults with diabetes in RAC <sup>(34, 140, 146)</sup> and are summarised in Table 8. The remaining eight documents are presented in Table 9, and include a broad range of clinical care targets and best practice recommendations which were developed for use by general practitioners, medical and allied health personnel predominantly in a community setting <sup>(2, 17, 123, 147-152)</sup>. Of these eight guidelines <sup>(2, 17, 123, 147-151)</sup> which incorporate information relating to medical and dietary management of diabetes, only the dietary section has been reviewed for key nutrition topics and these are summarised in Table 9.

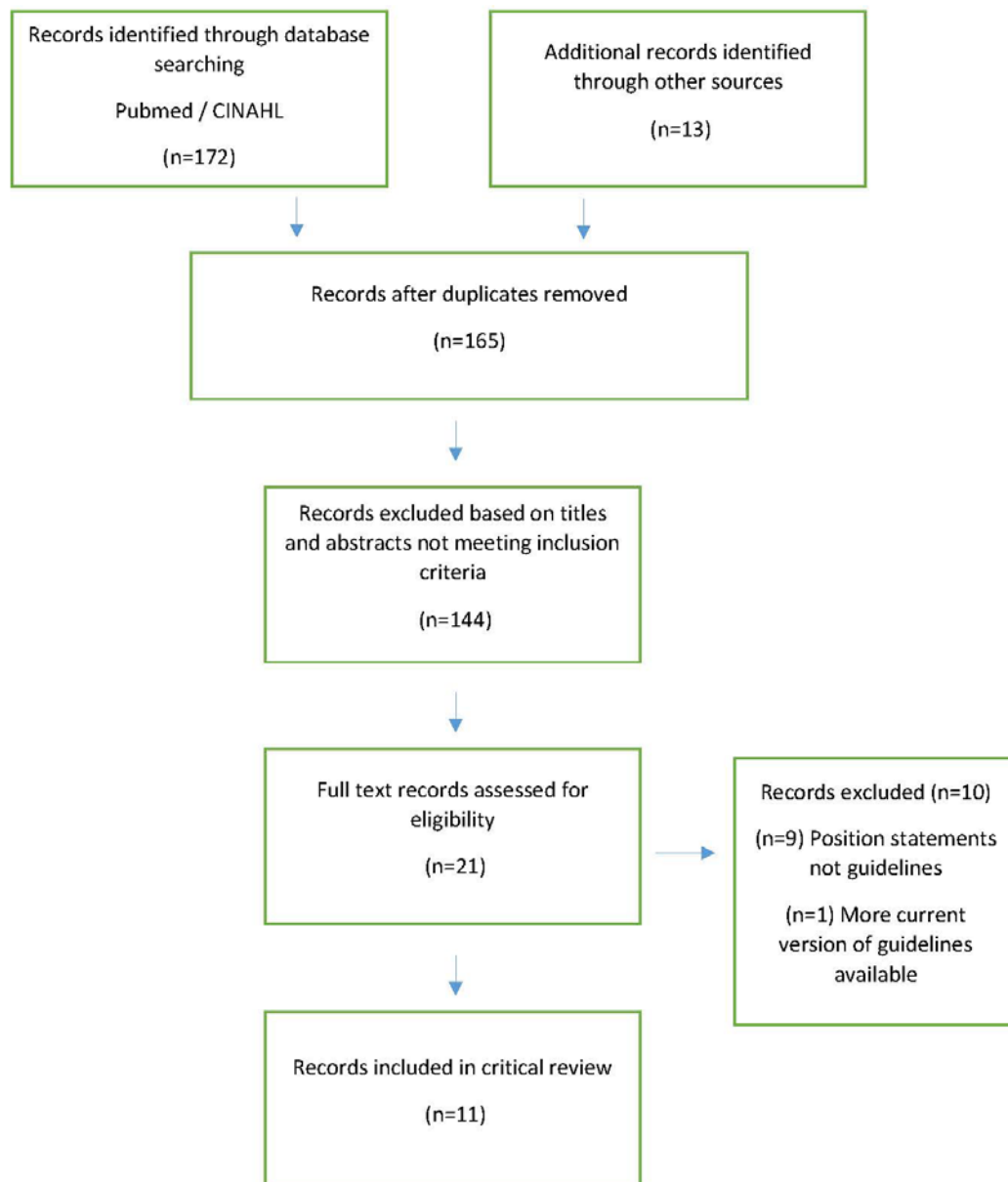


Figure 10- Study flow diagram of search strategy and screening of records for scoping review of management guidelines for older adults with diabetes

Table 8 - Overview of diet specific guidelines for the management of older adults with diabetes

Author	Year	Origin	Guideline Title	Dietitians on committee/author  (Yes / No)	Key Nutrition Messages	Quality Grading  (1-7)
The Caroline Walker Trust <sup>(140)</sup>	2004	UK	Eating Well for Older People: Practical and Nutritional Guidelines for Food in Residential and Community Care - second edition	Yes	Healthy eating focus with no restriction of carbohydrate  <ul style="list-style-type: none"> <li>- Low fat, especially saturated fat</li> <li>- High fibre, Low GI</li> <li>- Low sodium</li> <li>- Low sugar</li> <li>- Encourage fruit and vegetables</li> </ul>	4
Richardson T, Schneyder A. <sup>(146)</sup>	2012	South Australia	Healthy eating & diabetes: A guide for aged care facilities 2nd edition	Yes	Regular meals and snacks with healthy eating focus – consistent carbohydrate  <ul style="list-style-type: none"> <li>- Low GI options and high fibre offered daily</li> <li>- Sugar – moderation</li> <li>- Full fat dairy recommended</li> </ul>	3
Bartl R & Bunney, C <sup>(34)</sup>	2012	New South Wales, Australia	Best practice food and nutrition manual for aged care facilities 2nd edition,	Yes	Regular menu with consistent carbohydrate  <ul style="list-style-type: none"> <li>- Sugar can be included in the diet</li> <li>- Fat restriction is not indicated, offer full fat dairy</li> <li>- Low GI option(s) at each mealtime</li> </ul>	4

Table 9 - Overview of general management guidelines for the management of older adults with diabetes and key nutrition messages

Author	Year	Origin	Guideline Title	Dietitians on committee (Yes / No)	Key Nutrition Messages	Quality Grading (1-7)
Australian Diabetes Educators Association (ADEA) <sup>(149)</sup>	2003	Australia	Guidelines for the Management and Care of Diabetes in the Elderly	Yes	Encourage Dietary guidelines for Older Australians (now rescinded) <ul style="list-style-type: none"> <li>- Distribution of carbohydrate is important</li> <li>- Weight loss not recommended unless &gt;20% overweight</li> <li>- 30mins exercise per day</li> </ul>	6
Diabetes UK <sup>(152)</sup>	2010	UK	Good clinical practice guidelines for care home residents with diabetes	No	Regular meals based on a Low GI starchy food <ul style="list-style-type: none"> <li>- Low fat diet can facilitate weight management</li> <li>- Include plenty of fruit and vegetables/legumes</li> <li>- Limit sugary foods</li> <li>- Limit processed/salty food</li> </ul> For obese residents, weight loss of 5-10% recommended	6
Hawkes Bay Diabetes Clinical Advisory Group <sup>(150)</sup>	2012	New Zealand	Diabetes Care for Aged Residential Care Facilities in Hawkes Bay	No	All residents should receive the same menu <ul style="list-style-type: none"> <li>- High fibre, low fat, and moderate salt and sugar content</li> </ul> Includes specific recommendations of: <ul style="list-style-type: none"> <li>- Sugar up to 2tbsp per day – not in drinks</li> <li>- Normal condiments – up to 1 tsp per meal</li> </ul>	2

					<ul style="list-style-type: none"> <li>- Discourage icing on cakes</li> <li>- Half portions of sweetened desserts</li> </ul>	
International Diabetes Federation <sup>(2)</sup>	2013	Brussels, Europe	Managing Older People with type 2 Diabetes: Global Guideline	No	<p>Nutrition plan should be individualised</p> <ul style="list-style-type: none"> <li>- Consistent carbohydrate at each meal</li> <li>- Moderate sugar – soft drink and juice to be avoided</li> <li>- Maintain healthy weight where possible or weight loss in conjunction with exercise</li> </ul>	5
American Geriatrics Society <sup>(151)</sup>	2013	USA	Guidelines abstracted from the American Geriatrics Society Guidelines for Improving the Care of Older Adults with Diabetes Mellitus: 2013 update	No	<p>Nutrition plan should be individualised</p> <p>Education should be around:</p> <ul style="list-style-type: none"> <li>- Lipid management</li> <li>- Carbohydrate intake</li> <li>- Weight management</li> <li>- Ideally maintain activity levels &gt;150mins/week</li> </ul>	5
Deakin University and Barwon Health <sup>(148)</sup>	2014	Australia	The McKellar Guidelines for Managing Older People with Diabetes in Residential and Other Care Settings	Yes	<p>No separate ‘diabetic’ diet required</p> <p>Nutrition plan should be individualised</p> <p>Diet composition:</p> <ul style="list-style-type: none"> <li>- Protein = 10-20% calories (&gt;0.8g/kg/day)</li> <li>- Individualised targets for carbohydrate, fat and fibre (no parameters provided)</li> </ul>	5
The Royal Australian	2016	Victoria,	General practice management of type 2	No	*Generalised reference to older adults	

College of General Practitioners (17)		Australia	diabetes: 2016–18,		<p>Healthy eating focus</p> <ul style="list-style-type: none"> <li>- Low fat, especially saturated fat</li> <li>- High fibre, Low GI for glycaemic management</li> <li>- Low sodium</li> <li>- Low sugar</li> </ul> <p>Mediterranean diet may be useful in managing cardiovascular disease</p>	6
American Diabetes Association (123)	2017	USA	Standards of medical care in diabetes—2017	Yes	<p>Nutrition plan should be individualised and focus on quality of life</p> <p>Emphasis on healthy eating such as:</p> <ul style="list-style-type: none"> <li>- Mediterranean diet or DASH diet</li> <li>- Avoid sugar sweetened beverages</li> </ul> <p>Meal planning based on portion control may be useful with the elderly</p>	5

Overall six documents were pertinent to best practice in Australia <sup>(17, 34, 146, 148, 149)</sup> or New Zealand <sup>(150)</sup>, while two were sourced from America <sup>(123, 151)</sup>, two from the UK <sup>(140, 152)</sup> and one internationally applicable document, the IDF Global guideline, “*Managing older people with type 2 diabetes*”, originates from Brussels <sup>(2)</sup>. The AGREE II- GRS tool was used to appraise each document (n=11) and the scoring is included in Tables 8 and 9, with a score of 7 representing the highest quality and 1 the lowest quality <sup>(145)</sup>.

### **Guideline Quality**

The three diet specific guidelines in Table 8 <sup>(34, 140, 146)</sup> were primarily compiled by dietitians and scored the lowest quality values as determined using the AGREE II-GRS tool ( $\leq 4$ ). While they scored highly in sub-categories relating to relevance to the target population, usability and presentation, they lacked detail and information on how the literature was retrieved and synthesised to develop the document. As a result these documents often included a higher volume of consensus statements informed by practice rather than evidence.

Guidelines developed for broader reference to diabetes management than diet alone (Table 9), were more often led by physicians or researchers in the field of diabetes <sup>(2, 17, 123, 148-152)</sup>. These guidelines all made use of a steering group or consulted with key stakeholders from multiple professions, but only three out of the eight documents included dietitians on the panel <sup>(123, 148, 149)</sup>. The reporting process on evidence synthesis and quality grading was more comprehensive in the physician led documents, with the exception of the resource produced by Hawkes Bay clinical advisory group <sup>(150)</sup>. This guideline was developed from a local study examining glycaemic management through small diet manipulation trials with patients, and was therefore less robust when assessed using the AGREE II-GRS tool <sup>(145, 150)</sup>. The remaining guidelines scored highly ( $\geq 5$ ) although full marks were not awarded to any of the documents because none offered a completely transparent and reproducible report for the development of the guideline <sup>(2, 17, 123, 148, 149, 151, 152)</sup>. In addition physician developed documents were not scored as highly for practical or user friendly domains, when compared to the diet specific guidelines <sup>(34, 140, 146)</sup>.



#### **4.4.1 Key findings for diet recommendations**

##### **Healthy Eating**

All but two of the 11 guidelines made reference to healthy eating in their dietary recommendations which instead recommended an individualised meal-plan <sup>(148, 151)</sup>. Four documents <sup>(17, 140, 149, 152)</sup> referred more explicitly to the relevant population based healthy eating recommendations (UK and Australian) such as the Australian Dietary Guidelines <sup>(153)</sup> or the UK Dietary reference values and country specific publication <sup>(154)</sup> on healthy eating. The guidelines issued by the Australian Diabetes Educators Association (ADEA) <sup>(149)</sup> refer to healthy eating but do not offer explicit advice on the composition of the diet, the remaining three discuss healthy eating as being low in fat, sugar and salt and high in fibre <sup>(17, 140, 152)</sup>. Two of the guidelines make reference to alternative healthy eating diets including plant based diets such as a Mediterranean diet <sup>(17, 123)</sup> or the 'Dietary approaches to stop hypertension' (DASH) diet <sup>(123)</sup>, mainly as a strategy for managing cardiovascular comorbidities. Both of which are more recent publications addressing all aspects of diabetes management and were published in the last two years <sup>(17, 123)</sup>.

The remaining four guidelines although not referring to healthy eating specifically do recommend regular meals and while there is discordance in their approach to inclusion of sugar and full fat foods in the diet, all emphasise the importance of carbohydrate targets or consistent carbohydrate volumes throughout the day <sup>(2, 34, 146, 150)</sup>.

##### **High fibre and Low GI**

There is consensus amongst the guidelines that starchy carbohydrate sources should be high fibre and low GI <sup>(17, 34, 140, 146, 148, 150, 152)</sup>, with RAC nutrition specific guidelines offering a more practical suggestion that at least one item at each mealtime should be low GI <sup>(34, 146)</sup>.

##### **Low fat vs full fat diet**

Where there was less accord was on the subject of whether older adults should be offered a diet including low fat or full fat items, specifically dairy products such as milk and yoghurt. Five of the guidelines refer to fat content in the diet and support a low fat diet, with particular emphasis on low saturated fat <sup>(17, 140, 150-152)</sup>.

Conversely, the Australian nutrition and RAC specific guidelines recommend that fat restriction is not indicated in the provision of meals to older adults in RAC <sup>(34, 146)</sup>. In support of their recommendations for offering only full fat dairy, the guidelines cite the two studies most influential in bringing about the liberalised diet for diabetes management, by Coulston et al (1990)<sup>(32)</sup> and Tariq et al (2001)<sup>(51)</sup>. Of the four remaining guidelines, three do not make recommendations on this topic, <sup>(2, 123, 149)</sup> and the fourth suggests individualised targets for fat content in the diet along with other macronutrients <sup>(148)</sup>.

### **Added sugar**

The most significant disparity in recommendations is with regard to the inclusion of sugar in the diet, either in its raw form or in beverages and discretionary food items such as desserts and sweet snacks. Six of the eleven standards proposed caution around inclusion of discretionary foods as would be applied for the general population, and suggest either a low or moderate inclusion of added sugar in the diet <sup>(2, 17, 123, 140, 150, 152)</sup>. Three guidelines go on to further elaborate that while sugar does not need to be avoided, the provision of regular cordials and soft drinks should be prohibited to older adults with diabetes <sup>(2, 123, 150)</sup>; with one also suggesting avoidance of fruit juice <sup>(2)</sup>. The only document to quantify the level of sugar restriction was the guidelines for diabetes management in Hawkes Bay aged care facilities (NZ) <sup>(150)</sup> which specified a limit of 2 tablespoons of granulated sugar per day with meals. Both this document <sup>(150)</sup> and the *Healthy Eating and Diabetes Guide* <sup>(146)</sup> go further in suggesting that smaller, or half portions of 'very sweet' desserts should be offered to older adults with diabetes, and ordering of 'cakes with icing' should be discouraged <sup>(150)</sup>. Only one document supported 'ordinary amounts of sugar' in the diet <sup>(34)</sup> and recommends using medication to manage any impact this may have on glycaemia.

### **Weight management**

Only four of the guidelines discuss weight management as a goal <sup>(2, 149, 151, 152)</sup>. However each of these state the importance of combined physical activity with weight loss, which should only be initiated where there are health benefits such as increased mobility or for improved diabetes outcomes <sup>(2)</sup>.

## 4.5 Discussion

The findings of this scoping review are that documents guiding best practice for dietary management of older adults with diabetes are variable in quality and usefulness in their applicability to practice. The evidence on which all dietary recommendations are based appear to be the same two studies examining liberalised diet on diabetes outcomes that were found to be lacking in robust methodology or findings in chapter three <sup>(32, 51)</sup>. Overall there is uniformity of opinion on the importance of regular meals loosely based on healthy eating principles. However, there is some discordance in recommendations for how the diet might be liberalised, particularly in the inclusion of discretionary foods, particularly those high in added sugar as well as inclusion of full fat dairy foods.

The UK maintains an approach whereby older adults in RAC receive similar dietary instruction to those older adults in the community, and receive a standard menu with caution around offering added sugar, such as in drinks or very sweet foods <sup>(140, 152)</sup>. This guidance also promotes a low fat focus to the diet overall <sup>(140, 152)</sup>. Similarly, Australian and international physician led documents <sup>(2, 17, 123, 150, 151)</sup> approach dietary management of diabetes conservatively and cite the need for individualisation along with consideration of comorbidities with diabetes outcomes. Dietary liberalisation is recommended on evidence of malnutrition risk, such as when weight loss is observed, although the exact meaning of liberalisation is not explicit. Conversely, nutrition specific RAC guidelines in Australia <sup>(34, 146)</sup> preference a liberalised diet in the style of an energy dense diet for all residents, including those with diabetes. This is recommended as a prophylactic approach to managing malnutrition in institutional care. Although on closer examination key messages appear to be conflicted regarding how to implement liberalisation with regard to sugar <sup>(34, 146)</sup> with restrictive practices for 'very sweet' items still endorsed in one of the documents <sup>(146)</sup>.

Changes in diabetes management over the last two decades have been driven by the changing philosophy of care which identifies the need for prioritising individual preferences and quality of life <sup>(125)</sup>. While this can be more easily implemented in practice within a community setting, it has been proposed that individualisation in an institutional setting can be problematic <sup>(155, 156)</sup>. This review has highlighted that while we have several reasonable quality physician developed documents to refer to in the management of older adults with diabetes, none address the systems approach for how we might achieve individualised nutrition in institutional care. While Australian

nutrition in RAC specific guidelines somewhat address this gap<sup>(34, 146)</sup>, neither are mandated in practice and each offers some conflicting dietary messages around offering a liberalised diet. This has implications for food offerings in and between different RAC facilities, potentially impacting quality of life for residents with diabetes. In addition, nutrition guidelines specifically for RAC have seemingly approached recommendations for an 'at risk' (of malnutrition) target population, but may not have fully considered the impact of this on a heterogeneous cohort<sup>(34, 146)</sup>. The ageing population discussed in the literature often discuss the frail and malnourished<sup>(32, 33, 157)</sup>, but current research does not consider those older adults who may not be losing weight or who are not fully functionally dependent in an RAC setting. As proposed in chapter three, the lack of new evidence in this area may be due to the hesitancy to recruit older adults to nutrition studies which may impose dietary restriction and therefore negatively influence health and quality of life outcomes<sup>(101)</sup>.

### **Strengths and Limitations**

Limitations of this review are that the literature has been reviewed by only one author and search results were limited to documents written in English, and hand searches of literature from countries typically identified as having health systems similar to Australia. Despite this, no documents were excluded on the basis of country of origin, and the methodology of this review otherwise closely followed JBI protocol for scoping reviews<sup>(48)</sup>. Scoping reviews are not intended to provide answers to a research question, but instead offer an overview of what has already been developed or peer reviewed<sup>(48)</sup>. As such where the search has been developed to be robust and broad with limited exclusion criteria, the number of authors reviewing the data should not significantly impact the risk of bias. Overall, this review has highlighted the range in quality of guidelines for the management of older adults with diabetes, the limited evidence on which practice has been based and the disparity in how dietary liberalisation may be interpreted in practice. This review suggests that there is a need for a high quality guideline for the management of older adults with diabetes in RAC. This would ideally incorporate both a robust approach to the development of evidence based statements, such as in the physician led documents in this review: but also practical advice for the implementation of guidelines in an institutional setting, as in the dietitian led documents.

## 4.6 Summary

In summary, while the message across all of the documents is that a special 'diabetic' diet is no longer required in the management of older adults with diabetes, there is discordance regarding what dietary approach should be recommended. Most of the guidelines discuss the same approach for adults and older adults based on healthy eating guidelines and conservative weight management, but are not specific to an RAC setting. There is particular inconsistency regarding liberalisation of carbohydrate and added sugars in the diet, and some contention over whether the diet should be low fat or full fat as a standard. While guidelines that are applicable to older adults in the community can be individualised on a needs basis; the lack of consistency in dietary recommendations for older adults with diabetes in RAC is concerning. It was therefore prudent to explore what impact this was having on implementation of a liberalised diet for older adults with diabetes: but also to explore the current clinical presentation of older adults with diabetes in RAC, on which further research can be based. Chapter five first explores the extent to which a liberalised diet is being used in Australian RAC and which of the guidelines are acknowledged, if at all, in practice.

## CHAPTER FIVE - A WEB BASED SURVEY TO DETERMINE CURRENT PRACTICES IN AUSTRALIAN RESIDENTIAL AGED CARE

This chapter contains material from:

Farrer O, Yaxley A, Walton K, Milte R, Miller M. The 'diabetic diet': A web based survey for determining the incidence, rationale, composition and implications in Australian residential aged care facilities. *Jour Nursing Home Res.* 2017; 3:50-53.

(OF was the primary author of this paper and led the development of the research question, data collection, synthesis and drafting of the manuscript: parts of which are integrated into this chapter. RM and OF co-authored the original survey with diabetes specific questions developed by OF. MM, AY & KW assisted with supporting OF as PhD supervisors in analysing the data and all authors offered comments and editing of the cited paper)

### 5.0 Overview

The aims of this study were to evaluate the extent to which a therapeutic diet for residents with diabetes is still being provided for residents of RAC in Australia. For both RAC continuing to provide a 'diabetic' diet and those that did not, more information was sought to understand the rationale and the composition of what is being provided and consider the implications this may have for older adults with diabetes. This study is important in providing new information on whether the lack of robust evidence and endorsed clinical guidelines in the management of older adults with diabetes, is creating inconsistency in practice.

### 5.1 Research Question

To what extent are Australian RAC implementing liberalised diet recommendations for older adults with diabetes?

## 5.2 Background

The known incidence of diabetes in aged care is twice that in the general population and residents often have complex and varied clinical presentations as well as age related complications that will influence their functional independence <sup>(2, 30)</sup>. General advice for the management of all diabetes diagnoses, but particularly type 2 diabetes, focuses on reducing the risk of, or progression of complications through optimal blood glucose levels which can generally be achieved with a healthy diet and activity levels, and where possible maintaining a healthy body weight <sup>(2)</sup>. The ability to implement clinically meaningful levels of physical activity in RAC is limited, and therefore diet would ideally be the cornerstone lifestyle management option for this sub group of the population.

As discussed in earlier chapters, historically institutions like RAC have provided a therapeutic diet largely based on the same healthy eating recommendations promoted in community settings, utilising a framework of carbohydrate exchanges for meals and mid-meals <sup>(89)</sup>. More recently it has been recognised that such diets have the potential to be restrictive and <sup>(120)</sup> may promote malnutrition amongst aged care residents <sup>(158)</sup>. This concern for malnutrition prompted a review of medical nutrition therapy for older adults with diabetes where consensus is that traditional therapeutic diets offer no benefit in glycaemic management and are potentially overly restrictive and should therefore no longer be offered in RAC facilities <sup>(29, 68, 139)</sup>. Chapter four highlighted that current best practice documents for the dietary management of diabetes are broad with little or no differentiation between older adults who are functionally independent and those that are more dependent <sup>(17, 123, 151)</sup>. In addition, RAC specific guidelines for nutrition professionals have been developed <sup>(34, 146)</sup>, but the nutrition focus in one document in particular <sup>(34)</sup> has been written with a heavy emphasis on energy rich meals and snacks as a prophylactic strategy for preventing and managing malnutrition. While dietary restriction is not promoted in these guidelines, there is still hesitancy around how to manage an oral intake that does not impact on diabetes outcomes thus resulting in mixed messages around inclusion of sugar sweetened foods in particular. None of these documents are mandated for use in RAC and the extent to which changes in management approach and menu design have been implemented is hitherto unknown. This study aimed to determine what current practices and underpinning philosophy for the management of diabetes in older adults are used in Australian RAC facilities. This chapter aims to contribute new information on this topic should revised best practice guidelines be developed.

## **5.3 Methods**

This anonymous cross-sectional questionnaire was a two phase design to gather information from food service managers or an equivalent position, in Australian RAC. The initial phase involved piloting a web based questionnaire for ease of use and acceptability for question context and wording. The questionnaire was distributed to a test group of six individuals working in food service or the dietetics profession and who were identified as being in similar roles to those who would most likely respond to the final version of the questionnaire. After feedback was received minor grammatical changes and amendments to the visual presentation of the questionnaire were made. The final questionnaire was approved by Flinders University Social and Behavioural Research Ethics Committee (SBREC). The survey was distributed to named aged care manager emails purchased from an Australian marketing agency, 'A-Z GovBiz – public sector marketing lists' with an invitation for the food service manager or other suitable person to complete it.

### **5.3.1 Questionnaire Structure**

The questionnaire was created on website host Survey Monkey<sup>®</sup> (Palo Alto, Calif, USA) from which the results could be downloaded for analysis. The website provided a means to keep the responses confidential throughout the process. The questions were designed to ascertain the diversity in practice, an examination of what is being offered as a therapeutic diet for diabetes management and how this compares to historical provision and current guidelines. Most questions were multiple choice or best answer to describe the service with some allowing for open ended responses or multiple responses such as naming of menu standards they might use, to explore the philosophy behind offering a therapeutic diet or additional comments.

The questionnaire was informed by historical dietary management of diabetes and incorporated 25 questions specific to this study (40 questions in total) and was divided into four parts: demographics, the food service system, the menu and finally specific questions on therapeutic diets for diabetes management. An additional five conditional release questions were only revealed to those facilities indicating that they did provide a diabetic menu. These questions were designed to probe the way in which these meals were ordered, the quantity of diabetes-specific meals prepared per day and a series of statements related to food options available or unavailable on the 'diabetic' menu when compared to the standard menu. In addition, both RAC who provide a therapeutic diet and those that did not, were asked for insight into the philosophy behind their



practices. The conditional release questions were informed by findings from previous chapters regarding the historical composition of the therapeutic 'diabetic' diet as well as the recommended diet comprising of all core food groups.

The survey was delivered to valid personal email addresses for managers in Australian RAC. A copy of the survey is in Appendix 5. Respondents were given eight weeks to complete the online questions and received one courtesy reminder four weeks after sending the initial survey request. There was no additional incentive to participate other than a desire to assist with better outcomes in aged care via new research.

### **5.3.2 Data Analysis**

Data were retrieved from Survey Monkey® and analysed using IBM Statistics Package for the Social Sciences (SPSS) version 22. Descriptive statistics were used to describe the sample whereas Chi Square calculations were used to determine differences in responses to categorical variables between facilities that provide a 'diabetic' diet and those that do not. Statistical significance was observed at  $p < 0.05$ . To examine in more detail the composition of the diets presented to residents with diabetes, results were analysed for the frequency in which core food groups were either restricted or provided without restriction and the extent to which the same diet was offered to both residents with and without diabetes. Results were compared using Chi Squared tests also.

## **5.4 Results**

### **5.4.1 Respondent Demographics**

Of the 2075 questionnaires sent out to RAC management emails, n= 205 were commenced and 201 were completed in full (9.8% response rate). Incomplete questionnaires provided answers to all sections other than the therapeutic diet composition questions and therefore have still been included for descriptive analysis of results. Data from non-responders other than the facility name and email address were not available and therefore not included in data analysis. General demographic results for responders are shown in Table 10 and divided by state and territory. Most states and territories had respondents from all localities e.g. metro, rural; with the exception of NT (n = 1) and ACT (n=4) and yielded between 5-20% response rate for each state.

Table 10 – Total respondent demographics by state and territory and n (%) facilities still providing a therapeutic ‘diabetic’ diet

	<b>Total n (%)</b>	<b>NSW</b>	<b>VIC</b>	<b>QLD</b>	<b>SA</b>	<b>ACT</b>	<b>WA</b>	<b>NT</b>	<b>TAS</b>
	<b>n=205</b>	<b>n=71</b>	<b>n=46</b>	<b>n=43</b>	<b>n=11</b>	<b>n=4</b>	<b>n=18</b>	<b>n=1</b>	<b>n=11</b>
<b>Location</b>									
n (%)									
<b>Metropolitan/City</b>	69 (34)	22 (31)	10 (22)	16 (37)	5 (46)	3 (75)	9 (50)	0 (0)	4 (37)
<b>Outer-metro/Suburban</b>	50 (24)	18 (25)	13 (28)	12 (28)	2 (18)	0 (0)	2 (11)	0 (0)	3 (27)
<b>Rural</b>	79 (39)	29 (41)	22 (48)	14 (33)	4 (36)	1 (25)	6 (33)	0 (0)	3 (27)
<b>Remote</b>	7 (3)	2 (3)	1 (2)	1 (2)	0 (0)	0 (0)	1 (6)	1 (100)	1 (9)
<b>Number of Beds Median (IQR)</b>	17654	71 (43-108)	46 (35-90)	93 (62-136)	53 (30-120)	94 (37-250)	54 (39-86)	40 (40)	92 (69-105)
<b>Facilities offering a ‘diabetic’ diet n (%)</b>	121 (59)	45 (64)	29 (63)	22 (51)	7 (64)	3 (75)	10 (56)	1 (100)	4 (36)

Abbreviations: IQR = interquartile range; n = number; NSW = New South Wales; VIC = Victoria; QLD = Queensland; SA = South Australia; ACT = Australian Capital Territory; WA = Western Australia; NT = Northern Territory; TAS = Tasmania

The majority of facilities reported utilising a cook fresh system (n = 158, 77%) while all others either used cook chill (n=14, 7%), a combination of both systems (n=21, 10%) or received meals from external providers (n=9, 4%). Only two facilities used cook freeze as a production method and one did not respond to this question. With the exception of Tasmania (who only offered a therapeutic menu for diabetes management), more than half of the respondents in other states and territories still offered a therapeutic 'diabetic' diet for diabetes management (n=121, 59%) and each prepared 1 – 41 meals for older adults with diabetes, per day. The remaining facilities stated offering the same menu to all participants, with and without diabetes. The size of facilities varied significantly between states and ranged between 30 and 250 beds.

#### **5.4.2 Food Service Management**

Table 11 provides an overview of key personnel who were able to influence menu design and service in Australian RAC; also their access to dietetic input for day to day management of the facility menu, its review and design. For those facilities still providing a 'diabetic' diet (n=121, 59%), most often a manager with catering qualifications (n= 48, 40%) was responsible for the food service department and menu related decisions. In most other cases the department was reported to be managed by either a chef (n= 24; 20%) or cook, (n= 17; 14%). For facilities offering a therapeutic 'diabetic' menu, dietetic time for food service and menu review was primarily contracted in on a request only basis, 49% (n=59). When comparing the RAC with a 'diabetic' diet and those without, no significant differences were seen for management hierarchy ( $p= 0.357$ ) with most facilities hiring a food service manager with a catering background and relevant qualifications. Similarly no significant differences were observed for contracted dietetic time in menu review ( $p= 0.467$ ). Between facilities the responsibilities would often fall to a contracted dietitian, particularly in those facilities offering a 'diabetic' diet (n=50, 41%) which suggests that most food service departments may have limited access to a dietitian on a day to day basis.

Table 11 – Comparison of key personnel involved in menu development and delivery in Australian residential aged care (RAC) for those respondents still providing compared to those not providing a ‘diabetic’ diet

	<b>RAC providing a diabetic diet (n=121)</b>	<b>RAC not providing a diabetic diet (n=80)</b>	<b>P value</b>
<b>Food service management n (%)</b>			
Manager with catering qualifications	48 (40)	45 (56)	0.357
Manager without catering qualifications	12 (10)	5 (6)	
Nutrition/Dietetics Manager	2 (1)	0 (0)	
Nursing/Resident Services Manager	8 (7)	6 (8)	
Dietitian/Nutritionist	2 (1)	0 (0)	
Chef	24 (20)	10 (13)	
Cook	17 (14)	9 (11)	
Nursing	1 (1)	0 (0)	
Other	7 (6)	5 (6)	
<b>Dietitian employed for menu review n (%)</b>			
RAC food service dietitian	22 (18)	14 (18)	0.467
RAC clinical dietitian	12 (10)	9 (11)	
Clinical dietitian on casual contract	17 (14)	17 (21)	
Food service dietitian on casual contract	50 (41)	24 (30)	
Other	20 (17)	16 (20)	

Abbreviations: n = number. RAC = residential aged care facilities

### 5.4.3 The Menu

More than half of the facilities (n =142, 69%) reported using menu guidelines or standards for review or design of the menu. However in most cases these were not identified by name. Instead frequently generic dietetic (n=53, 26%) or aged care guidelines (n =19, 9%) or HACCP/Food safe standards (n =30, 15%) were cited. In addition a smaller number of facilities, (n=5, 2%) quoted using recommendations from an independent aged care consultancy company ([www.oscarhospitality.com.au](http://www.oscarhospitality.com.au)) and to a lesser extent (n=4, 2%) the 'Best Practice Food and Nutrition Manual for Aged Care Facilities <sup>(159)</sup>' (2004) were cited. A dietitian employed from an external organisation was most likely to review the menu for all facilities (n=50, 41%) or the facility employed food service dietitian (n=22, 18%) or contracted clinical dietitian (n=17, 14%). Least likely was the facility clinical dietitian (n=12, 10%) for those facilities still offering a 'diabetic' diet. Other answers included menu review by a contract dietitian but unknown whether clinical or food service background (n = 9), RN/CNC (n=4), external food provider (n=2), food service manager (n = 3), chef or cook (n=1) or allied health (n=1) which in this facility was an Occupational therapist. Similar responses were observed for those facilities not offering a 'diabetic' diet (Table 11).

### 5.4.4 Therapeutic Diabetic Diet

A total of 121 (59%) RAC reported offering a therapeutic diet for diabetes management which was generally provided automatically on admission (n=65, 54%). In other cases the diet was available if prescribed by either the dietitian (n=20, 17%), the medical team (n=15, 12%) or requested by the resident or family (n=6, 5%). A further 3% (n=4) respondents commented that their menu had been tailored to be suitable for all residents including those with diabetes and did not offer a separate ordering process but still identified as offering a 'diabetic' menu in the questionnaire responses.

Table 12 provides an overview of the meal exclusions and additions that occur in facilities providing a 'diabetic' diet and how this compares to the facilities' standard menu. A significant difference was found in the provision of all core and discretionary food groups for a therapeutic diet when compared to the standard facility menu and between facilities ( $p < 0.05$ , Table 12) suggesting significant inconsistency in offerings between facilities.

### ***Rice, pasta, potato or breads and cereals at mealtimes***

Approximately one-third of RAC reported limiting mealtime serves of starchy breads and cereals for residents with diabetes 32% (n=35), while 14% (n=15) reported offering them more regularly to residents with diabetes than those without. Low fibre choices were generally restricted for residents with diabetes (n=46, 43%) and wholegrain choices were more likely to be promoted (n=33, 30%). However, for the majority of facilities, breads and cereals were reported to be offered in similar volumes and varieties to all residents (Table 12).

### ***No added sugar/low sugar diet***

Residents with diabetes were more likely to be offered a restricted choice of sugar sweetened beverages (n=60; 57%) and more regularly offered a no sugar option (n=52; 48%) than those residents without diabetes. In addition, residents on a 'diabetic' diet were less likely to be offered sweet biscuits and cakes (n=73; 68%), or desserts and condiments containing sugar (n=68; 62.5%). Fruit and fruit juice were also frequently restricted for residents with diabetes, n=35 (32%) and n=52 (49%) respectively.

### ***Low fat and calorie restricted diet***

Residents on a 'diabetic' diet were likely to be offered low fat dairy serves 36% (n=38). However this was reported as a standard practice for all residents in almost half of the responding facilities (n=48, 46%). Low calorie desserts (n=47, 43%) and beverages (n=52, 48%) were also offered more often to residents with diabetes in respondent facilities with a therapeutic diet.

Table 12 – Overview of typical food restrictions and additions that represent the current ‘diabetic diet’ as compared to the standard menu offered to all other residents in Australian residential aged care (one way Chi Squared test)

	Total responses n=121	Restricted Choice n (%)	More frequently offered n (%)	No difference to standard menu n (%)	P value
<b>Fruit and Vegetables</b>					
Fresh, Frozen or Tinned	108	35 (32)	20 (19)	53 (49)	0.001
Fruit Juice	107	52 (49)	11 (10)	44 (41)	≤0.001
Fresh, Frozen or Tinned Vegetables	108	15 (14)	17 (16)	76 (70)	≤0.001
<b>Breads and Cereals</b>					
Wholegrain choices	109	18 (17)	33 (30)	58 (53)	≤0.001
Low fibre choices	107	46 (43)	16 (15)	45 (42)	≤0.001
Rice, Pasta, Bread or potatoes at mealtimes	108	35 (32)	15 (14)	58 (54)	≤0.001
Low GI choices	107	26 (24)	33 (31)	48 (45)	0.029
<b>Dairy and Milk Alternatives</b>					
Low fat dairy serves	105	19 (18)	38 (36)	48 (46)	0.002
Full Fat dairy serves	107	36 (34)	13 (12)	58 (54)	≤0.001
<b>Beverages e.g. cordial/soft drink</b>					

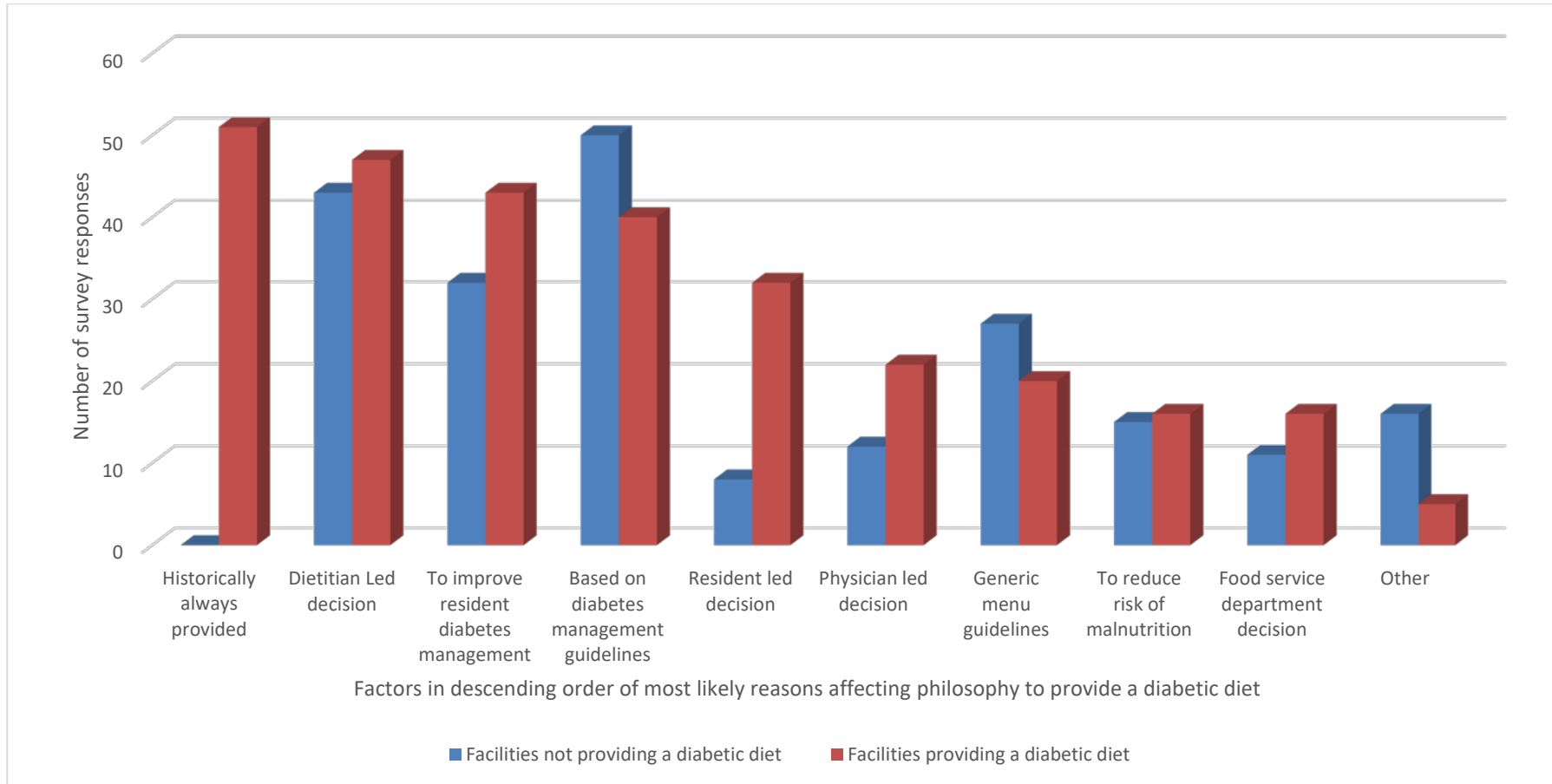
No added sugar	108	23 (21)	52 (48)	33 (31)	0.002
Sugar sweetened	106	60 (57)	20 (19)	26 (24)	≤0.001
<b>Desserts and snacks</b>					
No added sugar	109	23 (21)	47 (43)	38 (35)	0.017
Sugar sweetened	109	68 (62.5)	10 (9.5)	31 (28)	≤0.001
Sweet biscuits and cakes	108	73 (68)	8 (7)	27 (25)	≤0.001

Abbreviations: n = number, GI = glycemic index



Figure 11 outlines the rationale provided by respondents for why a therapeutic diet was offered as compared to facilities that did not provide it. Multiple selections could be made to this question in the survey, but the primary reason for offering a diet for residents with diabetes was that historically it had always been offered (n=51, 42%). In almost as many facilities (n=47, 39%) this was a dietitian led decision to continue offering the menu based on the philosophy that this style of menu would improve diabetes management (n=43; 36%). In addition, 33% of facilities (n=40) cited diabetes management guidelines as their reason for offering a separate menu (although exact guidelines were not named).

Conversely those facilities (n=80) that did not offer a therapeutic menu suggested that this decision was also predominantly a dietitian led decision (n=43, 54%) and also with reference to diabetes guidelines (n=50, 63%) which they felt would contribute to improved diabetes management (n=32, 40%).



NB – respondents were asked to tick as many responses from the categories as applied to their service.

Figure 11- Contributing factors to RAC philosophy in providing a therapeutic 'diabetic diet' vs decisions influential in not providing a therapeutic diet for Australian residential aged care survey respondents

## 5.5 Discussion

In the last two decades there has been consistent reference in American and Australian practice statements regarding the need for liberalisation of dietary recommendations for older adults with diabetes. Chapters three and four have highlighted that there may be several ways in which the liberalised diet could be interpreted and while most international and medical best practice guidelines have adopted a still somewhat conservative approach and recommend a healthy diet with inclusion of moderate amounts of discretionary foods, one locally produced RAC specific document has adopted a more liberalised approach <sup>(34)</sup>. However where the local and international guidelines are in consensus is that the diet should incorporate all core food groups and that a special therapeutic diet is no longer required for older adults with diabetes. This study aimed to explore the extent to which a restrictive style therapeutic ‘diabetic’ diet is still being offered in RAC and the composition of this diet.

The results from this Australian study suggest that more than half of the survey respondents still offer a therapeutic ‘diabetic’ diet to their residents. Facilities offering a ‘diabetic’ menu do not appear to be limited to particular geographic regions or in their food service staffing, nor do they differ significantly in their access to dietetic support which is relatively limited in most institutions. The decision to offer a separate therapeutic menu seems to be as a result of long held practices and perceived knowledge of best diabetes management. Diabetes and aged care specific menu guidelines were quoted as a significant factor in the reason to continue to provide a therapeutic menu, although in the majority of cases specific documents were not named in the survey responses. Aged care specific guidelines for menu planning are available and all consistently refer to there being no need for a separate special diet or restriction of food items <sup>(34, 146)</sup>. Although it has been acknowledged that despite this message there is discordance in their approach to inclusion of sugar sweetened foods particularly. These guidelines are also not mandated or widely promoted to dietitians for use in practice, so are unlikely to be widely known about <sup>(37)</sup> therefore it is unsurprising that historical practices were still in place. The results from this survey suggest that the lack of mandatory guidance is in fact contributing to inconsistencies in practice and food service design and delivery in RAC.

The therapeutic diets for diabetes management described by respondents in this study do still appear to be consistent with the theme of restriction, particularly restriction of those foods higher

in natural or added sugar. Although limiting of foods with added sugar is more aligned with physician guidelines <sup>(2, 17)</sup>, it is concerning that core food groups such as fruit are also being restricted for this population in a third of respondent facilities. The survey responses also suggest that starchy carbohydrates at mealtimes in approximately a third of facilities were being restricted, either in choice or volume at mealtimes. The restriction of these core foods raises concern for adequate intake of vitamins, minerals, fibre and calories in the diet overall. It is clear that liberalised dietary recommendations are either not known about or not implemented widely in RAC. In addition there is a lack of consistency in what is being interpreted as a liberalised diet where it is offered. This is likely to have an impact on transition to RAC and the subsequent experience for older adults with diabetes.

### **Limitations**

Although it is unlikely to affect the overall diversity in practice reported or the general nature of the therapeutic diet being offered; limitations of this study are that the questionnaire was distributed to food service managers in RAC who may have limited knowledge of the menu rationale or guidelines used to develop it, and this may have affected the quality of the answers received. In addition the survey responses are only a snapshot of generic menu offerings and did not provide opportunities to describe individualisation of menu items or additional rationale for why certain foods may be limited in offerings. Multiple choice questions can also initiate 'best fit' responses and facilities may not have been accurately represented in the findings. Future studies examining menu design in aged care may consider distributing a questionnaire to food service dietitians to best capture knowledge pertaining to the menu components and philosophy for an institutions' menu design with more free text responses or analysis of completed resident menus. This could be conducted in conjunction with a qualitative approach to best understand how such menus are implemented in practice.

### **5.6 Summary**

In summary, the findings of this study, although only an exploratory snapshot of what is occurring Australia wide, do confirm that there is diversity in practice when it comes to food service and diabetes management in RAC. In addition this study is in support of prior findings that there is a lack of awareness in key stakeholders of relevant guidelines for best practice <sup>(37)</sup>. Where a

therapeutic diet is offered to residents with diabetes the menu does appear to conform more to the restriction of sugar and discretionary items rather than a liberalised approach. More alarmingly though is the diversity in provision of core food groups to this cohort which has the potential to negatively impact micronutrient as well as macronutrient composition of the diet.

Although dietitians are key influencers of aged care menu design there appears to be a lack of consistency in practices across the country. This study has provided insight into what food choices older adults with diabetes in RAC are being offered and the personnel that influence the menu design and delivery. Going forward, it is clear that dissemination of best practice recommendations in diabetes management is important in working towards a consistent approach in RAC. Aged care specific menu guidelines that are endorsed Australia wide could also help promote consistent practice and better nutrition outcomes for older adults with diabetes.

Chapters three and four highlighted not only the discordance in guidance for dietary recommendations for older adults with diabetes, but also differing discussion of the cohort with respect to nutritional status and needs. Physician led documents focused mainly on a healthy ageing population <sup>(2, 17, 123, 148, 151)</sup>, calling only for individualisation of the diet and relaxation of diabetes targets such as HbA1c, as older adults become more functionally dependent <sup>(2, 17, 123)</sup>. Whereas dietetic focus more frequently discusses the ageing population broadly as at high risk for malnutrition and frailty, particularly those older adults with some functional dependency and in RAC <sup>(34)</sup>. This chapter has summarised how the diversity and lack of mandatory guidelines or 'controlling factors' is impacting food service delivery in practice and highlights the need for widely endorsed guidelines. In developing new guidelines it will be important to understand the needs and qualities of the intended recipients. Current aged care practice guidelines refer to a frail RAC population, up to 50% of which are at risk of under-nutrition or malnourished. However earlier chapters have identified the close relationship of type 2 diabetes particularly with ageing, obesity and cardiovascular disease: and hypothesised that the clinical presentation of older adults may be changing as a result. Chapter six aims to now better describe the ageing population with diabetes on which future research and practice documents could be based.

## CHAPTER SIX – A RETROSPECTIVE AUDIT EXAMINING THE RATIONALE FOR A LIBERALISED DIET FOR THE MANAGEMENT OF OLDER ADULTS WITH DIABETES IN RESIDENTIAL AGED CARE

This chapter contains material from:

Farrer O, Yaxley A, Walton K, Miller M. *Characteristics of older adults with diabetes: what does the current aged care resident look like?* Nutrition and Dietetics, 2018. <https://doi.org/10.1111/1747-0080.12418>

(OF was the primary author of this paper and led the development of the research question, data collection, synthesis and drafting of the manuscript: parts of which are integrated into this chapter. MM, AY & KW assisted with supporting OF as PhD supervisors in analysing the data and all authors offered comments and editing of the cited paper)

### 6.0 Overview

In the preceding chapters the evidence in support of a liberalised diet for older adults with diabetes is found to be lacking, but also the dissemination of revised dietary recommendations for this cohort variable. Current trends in population demographics suggest that this rapidly growing population of older adults may now be exhibiting a trend towards obesity which is persistent into older age and contributing to increasing numbers of older adults with diabetes<sup>(160)</sup>. General practice diabetes guidelines for older adults predominantly recommend similar dietary management approaches as for all adults based on the principles of healthy eating, regular meals and weight management<sup>(17)</sup>. However, the dietary management of older adults in RAC has come under much scrutiny as a result of high rates of malnutrition in RAC residents. The therapeutic diet recommended for best diabetes management is typically limited in fat, added sugar and subsequently discretionary foods. It has been proposed that these restrictions are unnecessary once older adults' transition to RAC, where the population is more at risk of underweight than overweight<sup>(32, 51, 68, 115)</sup>. However the literature on which these assumptions have been based is at least 20 years old and may not be representative of the current demographics of aged care.

The aim of this retrospective audit is to contribute to the literature a more current snapshot of typical characteristics of RAC residents with diabetes, particularly in view of the close relationship

between obesity and diabetes.

## 6.1 Research Question

How much does the current cohort in RAC reflect older adults with diabetes as described in the literature?

## 6.2 Background

The proportion of older adults over 65 years is growing and is projected to increase to 25% of Australia's population in the next 30 years <sup>(4)</sup>. Diabetes, particularly type 2 diabetes, is more prevalent in older adults (>65yrs) and is strongly associated with obesity, as well as being an independent risk factor for RAC admission with up to a quarter of all residents likely to have diabetes <sup>(76)</sup>.

There is limited literature addressing the clinical presentation of older adults with diabetes, however the two studies that were found, refer to a cohort with a typical body mass index (BMI) ranging between BMI 24 – 28 kg/m<sup>2</sup> and describing the population to be generally well nourished when evaluated for malnutrition risk or in assessment of weight history <sup>(76, 117)</sup>. Despite this, the systematic review in chapter three concluded that author consensus was that older adults with diabetes were at an increased risk of malnutrition particularly those receiving a therapeutic diet <sup>(32, 51)</sup>. As such changes to the therapeutic dietary management of diabetes in older adults have been proposed, including removal of restrictions on fat content, caloric restriction and exclusion of sugar and sugar sweetened foods <sup>(68)</sup>. However, as previous chapters have highlighted, the removal of this the MNT diet has either not been implemented or conversely modified diets may be at conflict with diabetes best practice recommendations for diabetes outcomes <sup>(35)</sup>. In the absence of mandatory and consistent 'controlling factors' <sup>(39)</sup>, food services are offering inconsistent food choices to older adults with diabetes.

Chapter four has demonstrated that best practice guidelines <sup>(34, 146)</sup> that are available for guiding RAC food services are limited in their applicability to a systems approach, with individualisation of diets problematic when catering for large numbers <sup>(156)</sup>. In addition, it is of note that the current ageing population or 'baby boomers' (characterised as adults born between years 1946 – 1965 ) are more frequently visiting health services for management of cardiovascular problems, obesity

and type 2 diabetes than ever before in history<sup>(15)</sup>. There may, therefore, be differences in presentation for different generations of older adults within RAC that have not been adequately represented in the literature. This study aimed to better understand characteristics of this population group which might be drawn on to inform discussion of diabetes management in RAC.

### **6.3 Methods**

A retrospective audit of resident records was conducted on a convenience sample of n=295 aged care residents with known diabetes in 13 aged care facilities; 12 of which were metropolitan and one a rural site, and all in South Australia. The sample size was calculated with a 95% (+/- 5%) confidence interval. This was based on a typical total RAC population in Australia and approximately 25% all residents as having diabetes. Thus requiring a sample size of n=289.5 individuals for statistical significance and ability to generalise to the wider population. In addition, care was taken by the candidate to approach and audit within facilities that represented different geographical and socioeconomic areas of the state and representing both metropolitan and regional areas.

Data collection included review of general admission and nursing documentation, current food service diet codes and malnutrition screening scores from 'in house' screening using either the MUST tool<sup>(161)</sup> or Mini Nutrition Assessment tool (MNA<sup>®</sup>) short form<sup>(162)</sup>. Also audited were medication charts and general observation and medical notes. Following ethical approval from the Flinders University Social and Behavioural Research Ethics Committee (SBREC), residents with diabetes were identified by nursing staff and confirmed by the researcher via their paper or electronic records, which were provided for onsite audit.

All residents with diabetes were included in the audit, irrelevant of their type of diabetes or their medical management and health status. Written consent from the residents was waived by the SBREC in this instance to help eliminate a skew in results towards only having data for those residents able to consent and who were not cognitively impaired. Additionally, no exclusion criteria relating to length of stay, diagnosis or permanency of placement was applied for the purpose of data collection.

Data was collected as de-identified information and included demographic information: age (years), gender, date of admission to RAC, co-morbidities, previous medical history and



biochemistry and a list of medications. The clinical targets used to define optimal management of diabetes were based on the International Diabetes Federation (IDF) global guideline for management of type 2 diabetes in older adults for HbA1c and general practice guidelines for total cholesterol <sup>(2, 17)</sup>;

- HbA1c – generally 7.0% - 8.0% (which could also be recorded in the new International standardised units, 53-64mmol/mol)
- Total cholesterol - <4.0 mmol/L

Biochemistry targets were taken from a document specific to type 2 diabetes due to the known higher prevalence of type 2 diabetes in RAC. These targets could also apply to individuals with type 1 diabetes, with some acknowledgement of the need for individualisation where appropriate <sup>(2)</sup>. Physical assessment data included current and admission weight (kg), height (cm), malnutrition screening score (generated either from a MUST or MNA screening tool) and food services diet code, as well as a body mass index (BMI, kg/m<sup>2</sup>) for admission and time of audit calculated when both weight and height were recorded. There has been some debate as to whether BMI is sensitive enough to determine malnutrition risk, particularly where loss of lean body mass to increase visceral fat (also known as ‘sarcopenia’) may be present but not clinically assessed <sup>(163)</sup>. A study by Miller et al (2009) <sup>(164)</sup> evaluated applicability of using BMI to measure nutritional status. The study found that a relationship does exist between poor nutritional status as measured by a low BMI, and an increased risk of mortality associated with BMI <23 kg/m<sup>2</sup> but also >30 kg/m<sup>2</sup>. Similarly, more recent meta-analyses (2014 & 2015) of BMI and all-cause mortality in older adults <sup>(20, 165)</sup> found that a BMI < 23kg/m<sup>2</sup> is associated with increased mortality risk in the general aged care population. The studies also noted a ‘U’ shaped relationship in the data meaning a BMI >30 kg/m<sup>2</sup> was also shown to be associated with negative health outcomes <sup>(20)</sup>. As such BMI was determined sensitive enough to draw conclusion on nutritional status and the revised BMI healthy range of 23-30 kg/m<sup>2</sup> was used for analysis in this study. This is despite the revised ranges not being adopted in malnutrition screening tools as yet and BMI <18kg/m<sup>2</sup> still used as the cut off for underweight and 25kg/m<sup>2</sup> the upper end of healthy and desirable weight change.

Nutrition screening scores were generated for all residents by either the facility Dietitian or staff working in the care facility during regular health screening. The malnutrition universal screening tool (MUST)<sup>(161)</sup> or the MNA short form (MNA-SF) <sup>(162)</sup> was used by all facilities in all audited sites

to identify residents who might be at risk of malnutrition or monitor nutritional status; with a score of '0' for MUST or '12-14' for MNA-SF and representing no risk of under nutrition or normal nutritional status; '1' or '8-11' for being a moderate risk or at risk of undernutrition malnutrition and a score of '2' or '0-7' meaning the resident was at high risk or was malnourished for MUST and MNA-SF respectively <sup>(161, 162)</sup>. For the purpose of statistical analysis, the residents scoring either 'at risk' (1 or 8-11) or moderate to high risk of malnutrition (2 or 0-7) were collapsed into one grouping for comparison against those residents identified as not at risk. Residents without a nutrition score (n=37) were those who had either not required a review by the Dietitian or who had not been screened in the last 12 months by the facility care staff and were not included in the analysis.

Statistical analysis calculated frequencies (%) and measures of distribution, describing the general characteristics of older adults with diabetes such as distribution of gender, typical medical and dietary management of residents, and anthropometry. Data was analysed for the whole cohort initially and also categorised into three older adult age groups, young old (65-74 years), old-old (75-84 years) and oldest old (>85 years) and presented to determine whether generational differences in clinical presentation existed. Where the data was not normally distributed a Kruskal-Wallis test was used for comparison across the groups or where data was categorical a Chi Squared ( $X^2$ ) test of association was used.

Those residents with a nutrition screening score (n=258) were included in an additional analysis of differences in characteristics between residents not at risk and those at risk of malnutrition. Not normally distributed data was analysed using a Mann Whitney U test for continuous data and  $X^2$  test for categorical data. The data was then explored using hierarchal multiple regression to identify relationships between resident variables and malnutrition risk. All tests assumed a significant *p* value of <0.05 and were analysed using IBM SPSS statistics version 22.0 (Armonk, NY: IBM Corp) <sup>(166)</sup>.

## **6.4 Results**

Of the 13 RAC included in this study, a total of n=295 residents were identified as having diabetes out of a total population of n = 1298 residents across all 13 sites providing a prevalence estimate of 23% and 95% of which had type 2 diabetes (n=280). Their general characteristics are presented

in Table 13. Residents with diabetes were predominantly female (67%, n=198) which although is statistically significant is an expected finding for an ageing cohort ( $p = 0.026$ ). The largest proportion of all residents with diabetes regardless of gender, were in the oldest old category ( $\geq 85$  years) representing 51% (n=151) of all older adults with diabetes. Median age for the whole cohort was 85 years (IQR 80 – 89years). The average length of stay (LOS) ranged from 1 – 204 months for all residents (n=295) with a median LOS of 24 months (IQR 12-46 months) which was also significantly different across the age groups ( $p = 0.027$ ). Of the whole cohort, 41% of residents (n=121) were within an adjusted healthy BMI range (23-30 kg/m<sup>2</sup>) and 39% (n= 39) were obese (BMI >30 kg/m<sup>2</sup>).

Table 13- Residents' with diabetes and their characteristics, with significance between age groups determined via Kruskal-Wallis or X2 test

	<b>Total Cohort</b>	<b>65-74yrs</b>	<b>75-84yrs</b>	<b>≥85yrs</b>	<b>p value</b>
	<b>(n=295)</b>	<b>33 (11%)</b>	<b>111 (38%)</b>	<b>151 (51%)</b>	
<b>Gender n (%)</b>					
Male	97 (33)	16 (48)	41 (37)	40 (27)	<b>0.026</b>
Female	198 (67)	17 (52)	70 (63)	111 (73)	
<b>LOS (months)</b>	<b>1-204</b>	<b>2-125</b>	<b>1-204</b>	<b>1-154</b>	<b>0.027</b>
range					
<b>Type 2 diabetes (n (%))</b>	<b>280 (95)</b>	<b>29 (88)</b>	<b>104 (94)</b>	<b>147 (97)</b>	<b>0.061</b>
<b>Diabetes Management* n (%)</b>					
Diet alone	31	10 (32)	40 (37)	90 (60)	
Diet and OHA	109	17 (55)	57 (52)	54 (36)	<b>&lt;0.001</b>
Diet and OHA and/or Insulin	149	4 (13)	12 (11)	5 (3)	
<b>Weight (kg) median (IQR)</b>					
Admission	71.1 (61-81)	80.4 (73-97)	73.4 (65-88)	68 (58-75)	<b>&lt;0.001</b>
Current	72.3 (60-84)	87 (71-90)	76.4 (65-90)	66.6 (57-76)	<b>&lt;0.001</b>
<b>Current BMI (kg/m<sup>2</sup>) median (IQR)</b>	<b>27.6 (23.3-31.4)</b>	<b>31.0 (26.5 – 35.0)</b>	<b>29.2 (24.1-33.4)</b>	<b>25.6 (22.6 – 28.9)</b>	<b>&lt;0.001</b>
<b>Adjusted BMI ranges (kg/m<sup>2</sup>) n (%)</b>					
<b>&lt;23</b>	<b>60 (20)</b>	<b>3 (10)</b>	<b>17 (17)</b>	<b>39 (29)</b>	
<b>23-30</b>	<b>121 (41)</b>	<b>11 (35)</b>	<b>41 (41)</b>	<b>73 (54)</b>	<b>&lt;0.001</b>

	>30	114 (39)	17 (55)	43 (43)	23 (17)	
<b>HbA1c (%)</b> median (IQR)**		6.6 (6.0-7.3)	6.2 (5.6-6.7)	6.8 (6.1-7.7)	6.4 (6.0-7.3)	0.076
<b>Total Cholesterol (mmol/L) ***</b>		4.2 (3.5-5.2)	4.0 (2.7-4.9)	4.4 (3.4-5.5)	4.2 (3.5-4.9)	0.427
median (IQR)						
<b>Albumin (mmol/L)</b> median (IQR)		35 (33-39)	35 (32-37.5)	36 (33-40)	35 (33-38)	0.653
<b>Comorbidities (%) †</b>						
Hypercholesterolemia /Hypertension		144 (49)	12 (36)	48 (43)	84 (56)	<b>0.038</b>
Cardiovascular disease		200 (68)	22 (67)	79 (71)	99 (66)	0.665

**Abbreviations:** n = number; yrs = years; kg= kilogram, LOS = length of stay; OHAs = Oral hypoglycaemic agents, BMI = body mass index, IQR = Interquartile range

\*Diabetes management missing data: n=150

\*\* HbA1c data n=150

\*\*\*Total Cholesterol n=208

P < 0.05 is considered statistically significant

†Data for comorbidities was recorded as separate entries and so individuals may be represented twice for hypertension and cardiovascular disease

#### **6.4.1 Clinical presentation of residents with diabetes**

Of the total cohort 83% (n=246) residents with diabetes presented with comorbidities including raised blood pressure, cholesterol or cardiovascular disease (CVD). Just under half of all residents with diabetes had had their HbA1c tested in the previous 12 months (n=150), which for many of which was the only measure of diabetes management. Day to day blood glucose testing was sporadic for most residents and generally limited to those on insulin. Most were within desirable levels for HbA1c (n=150) with median HbA1c of 6.6 mmol/L, IQR 6.0-7.3, despite significant differences between residents managed by diet or by medication for diabetes (<0.001). More residents had been tested regularly for lipid profiles and general biochemistry, and had close to ideal levels for cholesterol (median 4.2mmol/L, IQR 3.5-5.2) with no significant differences for biochemistry across the age groups (Table 13).

#### **6.4.2 Generational differences**

The young old represented 11% (n=33) of the cohort and more than half of them (n=17, 55%) were being managed with oral hypoglycaemic agents (OHAs) or OHAs and insulin (n=4, 13%) as compared to the oldest old (>85yrs) who were predominantly managed by diet alone (n=90, 60%) as seen in Table 13. The BMI ranged broadly from 17.4 – 53 kg/m<sup>2</sup>, with the median BMI for the young old being the highest for the whole cohort at 31 kg/m<sup>2</sup> (IQR, 26.5-35). Median BMI showed a downward trend for the two older generations, with the oldest old (>85yrs) reporting a median BMI 25.6 kg/m<sup>2</sup> (IQR, 22.6-28.9). In a similar fashion, residents' weight typically increased between admission and data collection (current weight) for residents aged between 65–74 years and 75-84 years, but for the oldest old ≥85yrs, weight was more likely to have decreased since admission, as seen in Table 13. This proved statistically significant when comparing weight at admission and current weight between the age groups ( $p < 0.001$ ).

Independent of age, when examining the relationship between weight and malnutrition risk, change in weight was significantly different for those at moderate to high risk of malnutrition (mean SD -2.76±8.3kg) and those residents not at risk (2.37±7.5kg),  $p < 0.001$  (Table 14). This was also reflected in a significant difference in BMI between these groupings of residents (<0.001). Residents at risk of malnutrition were more likely to have a median BMI of 24 kg/m<sup>2</sup>, IQR 20-28. This compared to those not at risk, who had a higher median BMI of 29 kg/m<sup>2</sup>, IQR 25 – 33).

Table 14 – Typical characteristics for residents with diabetes compared to malnutrition risk score and significant differences between groups ( $p < 0.05$ )

	<b>Total (n=258)</b>	<b>Not at risk of malnutrition (n= 168, 65%)</b>	<b>Moderate to High risk of malnutrition (n=90, 35%)</b>	<b>p</b>
<b>Age years</b> (median, IQR)	85 (80-89)	84 (78-89)	85 (80-90)	0.220
<b>Current BMI</b> (median, IQR)	27.6 (23.3 – 31.4)	29 (25-33)	24 (20– 28)	<b>&lt;0.001</b>
<b>Length of stay, months</b> (median, IQR)	24 (12-46)	24.5 (12-46)	27.5 (13-47)	0.338
<b>Weight Change (kg)</b> (mean, SD)	0.44±8.1	2.37±7.5	-2.76±8.3	<b>&lt;0.001</b>
<b>Resident Diet code n (%)**</b>				
Standard	62 (24)	40 (24)	22 (24)	<b>&lt;0.001</b>
Diabetic	115 (45)	94 (56)	21 (23)	
HEHP	62 (24)	18 (11)	44 (49)	
Weight reducing	19 (7)	16 (9)	3 (3)	
<b>Texture Modified Diet code n (%)</b>				
Normal	6 (13)	2 (1)	4 (4)	<b>&lt;0.001</b>
Soft – Texture A	16 (34)	10 (6)	6 (7)	
Minced and Moist-Texture B	23 (49)	2 (1)	21(23)	
Smooth Pureed – Texture C	2 (4)	0 (0)	2 (2)	

**Abbreviations:** n = number, kg = kilogram, IQR = interquartile range; OHA = Oral hyperglycaemic agents; HEHP = high energy and high protein; WR = weight reducing

\*Diabetes management n= 289;

\*\*Diet code n = 258, of which n=47 were texture modified

P <0.05 indicates a statistically significant difference

### 6.4.3 Therapeutic diet codes and malnutrition risk

Of the residents with diabetes that had been screened for malnutrition risk, 35% (n=90) were identified as being at risk of malnutrition or were malnourished (Table 14). There were significant differences between those not at risk and those at risk of malnutrition when comparing to individual food service diet codes including for those receiving texture modified diets ( $p < 0.001$ ). Although on examination of the data, proportionally more residents not at risk of malnutrition were on diets considered in the literature as restrictive, such as therapeutic 'diabetic' diets (n=94, 56%) and weight reducing diets (n=16, 9%), when compared to those residents identified as at risk or malnourished; n=21 (23%) and n=3 (3%) respectively.

Hierarchical logistic regression was performed to further examine the relationship between diet codes, diet texture and malnutrition risk while also considering typical confounders. The model contained six independent confounders (gender, age, length of stay, diet code and texture of diet). The full model containing all predictors was statistically significant  $X^2(9, n= 258) = 78.697, p < 0.001$ , indicating the model was able to distinguish between respondents who were identified as not at risk and those at risk of malnutrition. As seen in Table 15, residents on a high energy and high protein (HE/HP) diet (OR 3.55, 95% CI: 1.55-8.09) or on a soft textured diet (OR 13.44, 95% CI: 4.31-41.86) were significantly more likely to also have been identified as at risk of malnutrition. A 'diabetic' diet code was found to have an inverse significant relationship with malnutrition (B = -1.15); with those residents with diabetes on a 'diabetic' diet code significantly less likely to have been identified as at risk of malnutrition (OR 0.317, 95% CI: 0.15 – 0.69). Gender, age and length of stay were not identified as predictors for risk of malnutrition.



Table 15 – Hierarchical logistic regression analysis identifying variables that may predict likelihood of residents with diabetes being at risk of malnutrition

Variables	B	P value	OR	95% C.I. for Odds ratio	
				Lower	Upper
Gender	0.17	0.958	1.018	0.533	1.943
Age (years)	0.00	0.993	1.000	0.960	1.041
LOS (months)	-0.00	0.761	0.998	0.986	1.010
<b>Diet code – Standard diet</b>		<b>&lt;0.001</b>			
Diabetic	-1.15	<b>0.004</b>	0.317	0.146	0.686
HE/HP	1.27	<b>0.003</b>	3.546	1.554	8.092
Weight reducing	-1.36	0.075	0.256	0.057	1.148
<b>Diet texture – Normal</b>		<b>&lt;0.001</b>			
Soft –Texture A	2.60	<b>&lt;0.001</b>	13.439	4.314	41.863
Minced and Moist – Texture B	1.221	0.155	3.392	0.630	18.258
Smooth Puree – Texture C	0.732	0.307	2.079	0.510	8.471

**Abbreviations:** LOS = length of stay; HEHP = high energy/high protein

## 6.5 Discussion

Generational differences in our ageing population will likely bring about differing clinical presentations in older adults and may bring new challenges to our health care services, particularly RAC<sup>(167)</sup>. Currently there are over a quarter of a million older adults residing in Australian RAC facilities<sup>(8)</sup> and approximately a quarter of them will have diabetes<sup>(76)</sup>. The largest age group (~57%) being the oldest old (>85yrs) or 'depression babies' who were born in a time of food rationing and scarcity<sup>(8)</sup>. This is significantly different to the experience of our emerging older adult or 'baby boomers' who have had abundant access to food and who are more likely to present to RAC with obesity and related comorbidities<sup>(15, 168, 169)</sup>.

The findings from this study were consistent with prior studies' examining typical BMI for older adults with diabetes<sup>(76, 170)</sup>, and typically had a median BMI of 27.6 kg/m<sup>2</sup>, which was a little higher than previous published data<sup>(76)</sup>. By stratifying the results by age-groups the data highlighted generational differences in weight and BMI with younger older adults more frequently presenting with BMI values higher than the cohort median range (median BMI 29-31kg/m<sup>2</sup>), and in most cases gaining weight and increasing BMI from time of admission over a median length of stay of 24 months. This is in contrast to the oldest old (>85yrs) who were more likely to have been admitted with a BMI under the group median (median BMI 25.6kg/m<sup>2</sup>) and who subsequently were more likely to have lost weight over the same period. This clinical presentation of the oldest old is much more indicative of the 'frail' and 'at risk' population discussed in the literature on which liberalised diet recommendations for older adults in RAC have been based<sup>(32, 51)</sup>. Whereas the clinical presentation of younger older adults support theories that baby boomers will more frequently present to health and ageing services as overweight or obese and with significant comorbidity<sup>(4, 15)</sup>. This presents potential complications for offering the same diet to all residents with diabetes within a system that only identifies protein - energy malnutrition risk, and where therapeutic diets and intentional weight loss are discouraged.

Literature supporting a liberalised diet proposes that the traditional therapeutic diet for diabetes management may increase risk of malnutrition due to its potentially restrictive nature<sup>(51, 68, 138)</sup>. The data from this study suggests that approximately a third (35%) of all older adults with diabetes in RAC were at risk of malnutrition or malnourished. This is lower than published estimates of approximately half of all older adults within RAC<sup>(157)</sup>. In addition, logistic regression calculations in

this study found that those residents on a 'diabetic' diet code were 70% less likely to be at risk of malnutrition than residents on a standard diet code. Chapter five outlined the typical composition of therapeutic diets for diabetes management and surmised that they typically include some level of dietary restriction. Subsequently it is difficult to support assumptions made in the literature reviewed in chapter three, that a therapeutic diet will increase risk of malnutrition for older adults with diabetes <sup>(116)</sup>.

An additional finding of interest was that HbA1c appears to be well managed for all residents, with median levels within ideal ranges (IQR 6.0-7.3%). However, HbA1C was only tested in half (n=150, 51%) of the residents audited, and even then only tested annually despite general biochemistry being tested more regularly. Diabetes medication is typically titrated or initiated based on HbA1c results for older adults in RAC and so the fact that these tests were not ordered regularly for all residents with diabetes poses further need for evaluation of diabetes outcomes where changes to dietary management are occurring.

Finally, the data collection in this study supports findings from chapter five, that dietary management of older adults with diabetes is highly variable <sup>(35)</sup>. But unexpectedly this was not restricted to the continued use of a therapeutic menu. Residents identified as at risk of malnutrition in this audit would ideally have all been on a high energy/high protein food service diet code – or at the very least not on a therapeutic or weight reducing diet as per aged care best practice guidelines <sup>(34)</sup>. Results from this audit highlighted that 23% residents at risk of malnutrition were still being managed on a therapeutic 'diabetic' diet code; 3% on a weight reducing diet code, while 24% remained on the standard diet code. In total 50% (n=45) of all residents with diabetes who were identified as at risk, or malnourished were not being managed on a high energy/high protein diet code. This again raises the need for widely endorsed nutrition guidelines to promote consistent practice and best outcomes for all residents.

### **Strengths and Limitations**

A limitation of this study was the nature of the study design which offers only a snapshot of the characteristics of this subgroup with no rationale for food service diet code allocation or diabetes management. In addition, the data taken from aged care records was variable in detail and frequency of entries, and biochemistry was not routinely ordered to include HbA1c or not ordered at all. However, sufficient data to demonstrate statistical significance was collected and general

findings are consistent with prior literature examining resident characteristics, while also providing new data pertinent to the generational differences observed. A longitudinal design may be more appropriate for more thorough data collection and particularly in determining correlation between malnutrition risk and diet composition; while qualitative studies to observe practices in RAC and explore resident experience of dietary management in RAC would offer more contextual evidence on which to form new opinion.

## **6.6 Summary**

In summary, there were significant differences in the presentation of older adults with diabetes across the generations, particularly with regard to weight and BMI, both at admission and after an average length of stay of 24 months. Younger older adults generally present as more overweight with this weight more often increasing throughout their admission rather than decreasing. The overall risk of malnutrition for residents with diabetes appears to be lower for all age groups than the general institutionalised population. Overall, resident characteristics identified in this study were more frequently congruent with healthy weight or obesity than undernutrition; even when referring to the modified BMI range for older adults. Finally this chapter adds new information to the body of evidence that the way in which we are managing older adults with diabetes is inconsistent, and supports the need for mandated aged care guidelines.

It is clear from the literature review and two quantitative studies discussed so far in this thesis that a lack of 'controlling factors' and consistent advice are impacting menu design and food offerings (outputs) with reference to the food service model discussed in chapter two <sup>(39)</sup>. Chapter seven considers how these factors are also influencing the human resources that influence meal provision in RAC, and what barriers exist to successful implementation of any new guidelines that may be developed for this setting.

# CHAPTER SEVEN – EXPLORING FOOD SERVICE STAFF KNOWLEDGE AND PRACTICE IN THE DIETARY MANAGEMENT OF DIABETES IN RESIDENTIAL AGED CARE

## Abstract presented as a poster presentation:

10<sup>th</sup> Asia Pacific Conference on Clinical Nutrition, Farrer, O., Yaxley, A., Walton, K. & Miller, M. Exploring staff knowledge of diet and diabetes and implications this may have for practice. Adelaide, 2017

## 7.0 Overview

The preceding chapters have highlighted the lack of consistency in written guidance for the nutritional management of diabetes in older adults, lack of ‘controlling factors’ (chapter four), and subsequently the mixed messages being interpreted in the diverse menu offerings discussed in chapter five. Chapter six has proposed that the clinical presentation of older adults may be changing and this will be an important consideration in the development of any revised best practice guidelines for RAC. Subsequently, it is important to understand how the lack of widely mandated guidelines, with a consistent message for diabetes management is being received by staff working in aged care, what impact this may have on practices for supporting residents with diabetes and their food choices. A final consideration as a result of the outcomes of this study was to consider what barriers might exist for the successful implementation of future guidelines.

## 7.1 Research Question

How has the lack of mandatory guidelines impacted staff knowledge and practice in RAC?

## 7.2 Background

Dietitians are ideally placed to advocate for good nutrition and health outcomes for older adults; and as discussed in Chapter five appear to have influence over decisions such as menu design in RAC settings. However, due to the highly privatised nature of RAC in Australia, the visits can be varied and frequently on a contract only basis as observed in findings from the web based survey (chapter five) <sup>(35)</sup>. In the absence of dietitians being more present in RAC to conduct widespread malnutrition assessment and provide more individualised nutrition care plans for all residents, dietitians are often reliant on care staff to assist in promoting nutrition messages or implementing nutrition strategies and generating appropriate referrals.

Staff working in aged care, whether food service or care staff, play a significant role in the meal provision process <sup>(171)</sup>. Staff assisting with ordering and meal service, are able to impact the dining experience for residents at all points of the system: resident food choice, portion size and overall mealtime experience even down to how much the individual consumes if requiring feeding assistance. Food service staff and those responsible for the menu design have an additional layer of control as they often have authority over what meals will be prepared and offered to either all residents or different cohorts as determined by the provision of special diets. Despite studies highlighting the importance of staff attitude and quality food service in achieving resident satisfaction <sup>(171-173)</sup>, no studies have been conducted to explore how staff understanding or prior learning of the dietary management of diabetes is impacting on the resident experience, or what information is informing practice. This qualitative study aimed to determine what staff working in aged care with residents with diabetes understand about the dietary management of this condition, how this knowledge is informed and how this may impact on their practice and care for older adults with diabetes.

## **7.3 Methods**

### **7.3.1 Focus groups**

To examine what staff understood about the dietary management of older adults with diabetes and gain examples of how this might influence their interactions with this cohort, a focus group methodology was employed. Focus groups are suited to collect information to open ended questions posed such as those listed in Figure 12. Responses allow for consensus building and to solicit the views of staff on current and best practice in diabetes management in a more informal way; particularly engaging people who may otherwise have been reticent to participate in individual interviews <sup>(55)</sup>.

### **7.3.2 Participants**

In this study five focus groups were scheduled, although only four groups were attended by RAC staff. The inclusion criteria was only that participants had worked for the RAC facility and had a role in the food service system which could include meal ordering, serving of mid meals or main meals, meal assistance or removal of food trays from the resident at the end of the mealtime. The professional title of participants was not limited to food service staff as it was recognised that food service roles, particularly ordering and serving, are frequently delegated to care staff depending on the facility.

### **7.3.3 Recruitment**

The staff were recruited from five RAC sites belonging to three different aged care organisations, all of which identify as not for profit. Two of the organisations implemented a cook fresh system and one a combined cook chill/cook freeze system. Several of these organisations were also recruitment sites for the retrospective audit study in chapter six and subsequent resident focus groups discussed in chapter nine. Therefore a convenience sampling technique within these facilities with already established relationships was employed to recruit to the focus groups. This also supported the sequential nature of the overall study design, whereby the findings from these focus groups would help explain findings from the same sites in chapter six (and which will be again revisited for observations in chapter eight). On recommendation from SBREC and within the parameters of their ethics approval, participants received advertisements with the date, time and overview of what focus groups would entail from senior management at each site. Interested

parties could collect an information sheet and consent form from their workplaces prior to the focus group and attendance lists were generated by the host site for the researcher. All participants signed a consent form and understood that they could withdraw from the study at any time and that all discussions would be confidential and not affect their employment in any way.

Participation was voluntary and in all but two facilities the focus groups had to be attended in the staff members' own time. However, in two of the facilities, the organisation (the same for both facilities) made allowance for professional development activities within work hours and encouraged attendance at the focus groups in this study. As an incentive for attendance to the study focus groups participants were provided an optional professional development opportunity on current recommendations for dietary management of diabetes after the focus group had been recorded. The professional development session was provided by the candidate in the capacity of an accredited practising dietitian (APD)/diabetes educator.

#### **7.3.4 Data Collection**

All focus groups were conducted by the same person (OF) and digitally recorded. An interview guide was also used in these meetings to guide the discussion but was not intended to limit topics and free conversation was encouraged around each discussion point (Figure 12). The guide consisted of topics which were informed by the findings in chapters five and six which suggested there was variability in how diabetes is managed in RAC and knowledge of current best practice guidelines for diet and diabetes management. Questions were also developed to explore whether knowledge was obtained from other sources, such as the media or family members, and how this might also impact practice.

The focus groups began with each participant discussing their job title, length of employment and their knowledge of diabetes management and who helped shape this. Finally, participants were asked to discuss their understanding of the 'diabetic diet' and in their opinion, how appropriate they felt this was for the residents in their care who have diabetes. The focus groups lasted between 40 and 60 minutes and were transcribed verbatim, with all respondents and facilities being de-identified for analysis.



**Group Leader – Discussion questions, sub-questions and prompts:**

1. How long have worked for this facility?
  - i. Roughly in months/years
  - ii. Do you often assist with mealtimes or have contact with residents with diabetes in food related circumstances e.g. morning tea/supper/clearing trays
  
2. Have you had any education around what is or management of Diabetes?
  - i. What were the general recommendations e.g. GI, sugar, carbs etc...
  - ii. Who gave you the advice and when
  - iii. Can you give an example of using this in practice <if relevant>
  
3. In your opinion – how well does the food provision to residents with diabetes, match your education/understanding of diet and diabetes management?
  - i. Do you feel you have adequate understanding of what foods are suitable for older adults with diabetes?
  
4. In your opinion, how well received are the meals provided to residents with diabetes?
  - i. Prompt – Choice / Variety / Serve size / Mid meals
  - ii. Have there been any negative feelings towards menu items, specifically regarding how it may impact their diabetes or health?
  - iii. How have you dealt with these comments – do you agree/disagree with them?
  
5. Have you had to make any special meal arrangements for a resident with diabetes?
  - i. Different desserts / snacks – did you need dietitian/family involvement?
  
6. In a perfect world, what do you believe would make an ideal food service for residents with diabetes?
  - i. Mealtimes / location of mealtimes / variety of meals / cooked on site? / low sugar?

Figure 12 - Interview guide used in focus groups with RAC food service staff

### 7.3.5 Data Analysis

The verbatim transcribed material was analysed using line by line coding and constant comparison assisted by QSR NVIVO qualitative analysis software (version 10) <sup>(174)</sup>; with sequential review of the material looking for similarities and topics which would then be collapsed into key themes <sup>(63-65, 175, 176)</sup>. The text was read several times to gain an overall understanding of both the apparent and deeper latent meanings which was important in understanding how staff knowledge and perceptions were influencing how they interacted with older adults with diabetes in an aged care setting. This style of thematic analysis is thought to “*provide knowledge and understanding of the phenomenon under study*” (Heish, 2005, p.1278) <sup>(177)</sup>, with the systematic coding and identification of themes and patterns providing a subjective interpretation of the text. In this style of analysis, rather than counting the frequency of which words occur in the text, the text is categorised in blocks of text or ‘condensed units’ <sup>(175)</sup> that represent similar meanings <sup>(176)</sup> and are referred to in this discussion as ‘themes’ <sup>(175)</sup>. Ideally focus groups would be run until data saturation is reached: meaning no new topics are being generated. Data saturation is the assumption that no new information on the topic would be gleaned from further investigation with another sample <sup>(175)</sup>.

In another attempt to validate the analysis, a second researcher (KW, PhD candidates’ adjunct supervisor) also read the transcripts and followed the same steps in analysing the material and identifying topics, before both authors came together to reach consensus on key themes with exemplar quotes. The findings from all of the focus groups were collated and are discussed in this chapter within the context of the research question, food service model framework and in relation to previous study findings.

## 7.4 Results

Of the five focus groups advertised, only four were attended by RAC staff. Of the total participants for all attended groups (n=14), 86% (n=12) were female and 64% (n=9) identified as Australian born in nationality. Half of the participants had a University degree in nursing (n = 7, 50%), with a further 29% (n=4) having completed a TAFE qualification in either a care assistant or food service domain, with remaining attendees entering the workforce straight from school. Staff had generally been working in an aged care facility for longer than 5 years (n=9, 64%) and almost all staff had received some education around diabetes which included dietary management of diabetes (n=13,

93%). Although no-one had received information from a dietitian and frequently their education on diabetes was limited to their tertiary nursing studies. All of the focus group participants had a nursing or care staff background and assisted with meal ordering and meal service in their facilities. This is with the exception of focus group four, who were food service staff and involved in production more than meal service. An overview of the typical characteristics of RAC staff involved in food service can be seen in Table 16.

Table 16 - Typical Characteristics of Focus Group Participants

		Staff Focus Groups					Total n=14 (%)
		Group 1	Group 2	Group 3	Group 4	Group 5	
		n=7	n=1	n=0	n=4	n=2	
<b>Gender</b>	Male	1	0	0	0	1	2 (14)
	Female	6	1	0	4	1	12 (86)
<b>Nationality</b>	English	0	0	0	0	2	2 (14.5)
	Indian	1	0	0	1	0	2 (14.5)
	Australian	5	1	0	3	0	9 (64)
	Chinese	1	0	0	0	0	1 (7)
<b>Education</b>	Year 10	0	1	0	1	1	3 (21)
	Year 12	0	0	0	0	0	0
	Trade	2	0	0	1	1	4 (29)
	University degree	5	0	0	2	0	7 (50)
<b>LOT in role</b>	<6months	1	0	0	1	0	2 (14)
	6m – 2yrs	1	0	0	0	1	2 (14)
	2-5yrs	1	0	0	0	0	1 (7)
	5-10yrs	2	0	0	2	0	4 (29)
	>10yrs	2	1	0	1	1	5 (36)
<b>DM Education</b>	Yes	6	1	0	4	2	13 (93)
	No	1	0	0	0	0	1 (8)
<b>Educator*</b>	Food service	0	0	0	1	1	2 (15)
	Dietitian	0	0	0	0	0	0
	DM Educator	2	0	0	0	0	2 (15)
	Nurse	3	0	0	0	0	3 (23)
	More than 1 Health prof	0	1	0	3	1	5 (39)

**Abbreviations:** LOT = length of time; m = months; yrs = years; DM = diabetes; prof = professional

\*n=13 responses collected only, n=1 no education received

### 7.4.1 Theming of focus groups

A total of 20 topics were generated from all four of the focus groups attended, with focus group three having no attendees and subsequently no topics were generated. Figure 13 demonstrates that after the first focus group there was a sharp decrease in the generation of new topics.

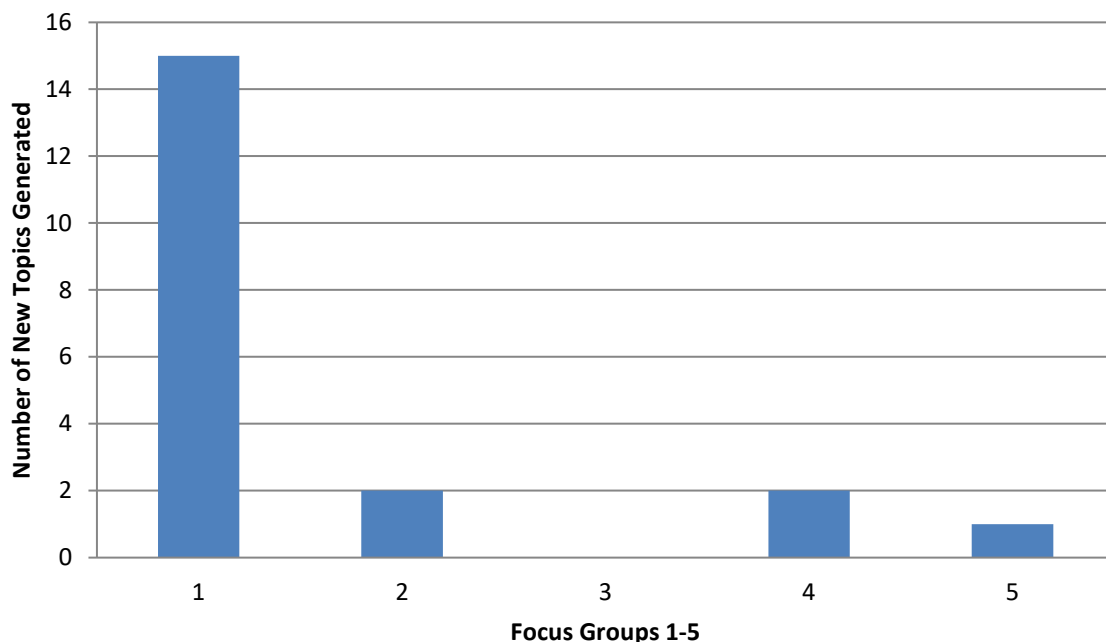


Figure 13 - New topics coded initially from sequential focus groups

Despite not being able to demonstrate that data saturation had been reached after the four focus groups, all of the topics identified from those groups attended had commonalities and were easily grouped into three overarching key themes. Further recruitment to more focus groups was not viable within the constraints of this study particularly in accessing further sites for recruitment. However the data collected would suggest that there is some consensus on experiences and opinion with regard to practice, and how these were informed. Table 17 identifies the three key themes and 13 topics (collapsed from the original 20 topics) as well as exemplar quotes, which were agreed via consensus with two researchers (OF & KW).

Table 17 - Overview of key themes and topics generated by focus group discussion of dietary approaches for diabetes management in older adults in RAC

Key Theme	Topics	Exemplar Quote
<b>Diabetes Knowledge and Understanding</b>	Personal experience / family	FG1 – <i>“I have just basic knowledge of diabetes through education years ago and personally through my mother...”</i>
	Professional education	FG1 – <i>“Apart from the things we learnt from the textbook I don’t have much experience”</i>
<b>Diabetes Management in Practice</b>	Age and cultural background	FG1 – <i>“...you know, you give them what they really want if they want it, but if they are in their say 60s or 70s you can talk them around and if you’re coming up to the 80s, 90s they don’t want to be changing their diet”</i> FG5 - <i>“...she couldn’t understand why they were giving her such a sweet. She was a different nationality as well so that made it harder...”</i>
	Clinical presentation	FG1 – <i>“...you might find that later on &lt;stay in RAC&gt;, they’re actually eating less, their intake is much less so therefore whilst they are eating the wrong things, the actual content is...it might actually even itself out”</i>
	Staff Health beliefs	FG1 – <i>“sometimes you know, I feel really a bit bad when I give them chocolate cakes or something because they are diabetic and they are having same dessert as a normal person”</i> FG4 – <i>“ I must admit myself even, the one dishing it up, when they first stopped doing the diabetic desserts I kept thinking , this can’t be right?”</i>
	Food Choice	FG4 – <i>“There was one lady in particular...she would get very nasty about not being able to have what she wants so I just sort of dish it up, not say anything and if you just put it in front of her, but if you gave her the</i>

*choice, she'd always choose the wrong thing.."*

FG1 – *"...and we're offering them yoghurt instead of ice-cream...but I must admit the yoghurts are not sugar free."*

Historical diabetic diet – low sugar focus

FG1 – *"You tend to find the long term diabetics are much more with it than the ones that are late age onset"* (in reference to choosing low sugar foods)

Self-management

FG4 – <on fruit dessert alternative> *"some diabetics prefer that by choice each day...unless there's something they can't resist and they think 'well, I'll treat myself today because I've been good all week' you know..."*

Diabetes management – hyperglycaemia

FG2 – *"But I see like a change in mood...those that are really outrageous and stuff like that, usually I'll check their sugar, do a BGL and just find out whether they've had too much sugar for the day and its skyrocketed"*

## **Food Service System**

Hierarchy – locus of control

FG1 – (care staff on speaking to a resident) *"So, okay we explain to them, 'Alright, if you want a drink but we can just change it to Equal not sugar"*

FG4 (Food service staff on deferring to Registered nurses) – *"well I go by what I'm told to do obviously because I've got no authority and whatever..."*

Menu design

FG4 – *"but they have got a second choice, you know if we've got a sticky date pudding for dessert or something really sweet, they can choose fruit or yoghurt as an alternative"*

FG4 – *"it's usually the diabetics can order a supper sandwich, or a fruit with it as well...but the diabetics get a supper sandwich if they want it or need it"*

Dining environment

FG2 - *"Usually they have their special little seat. If someone sits in that well then you're going to hear about it, 'tell her to get out!'"*

Communication of  
policy change

FG4 – *“I just picked it up as part of the handover...I think just all of a sudden we just got told that there weren’t going to be separate desserts anymore....We all get sort of a memo it there’s any change...depends if they choose not to read it.”*

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Abbreviations: FG = focus group



#### **7.4.2 Theme 1 - Knowledge and Understanding**

The majority of staff participating in the focus groups were aware of recommendations to liberalise the diet for diabetes and that there does not need to be a separate menu for this cohort. Most of the participants were care staff rather than food service staff, and had therefore received some basic education on diabetes in their training or in two of the facilities, via annual clinical updates (FG1 and FG 5). Participants from these facilities both belonged to the same organisation and was the only organisation within those recruited from, to provide dedicated professional development time within work hours. Despite this, many of the staff also had acquired knowledge of diabetes management through having a family member or themselves being diagnosed with diabetes or had been nursing when prescriptive therapeutic diabetic diets were in place,

*FG1 – “I have just basic knowledge of diabetes through education years ago and personally through my mother.”*

Traditional education around the restriction of sugary foods and drinks persisted with these staff members and at times there appeared to be tension in what food choices older adults with diabetes could have based on the more recent liberalised diet and their own perception of how diabetes should be managed;

*FG4 - “ I must admit myself even, the one dishing it up, when they first stopped doing the diabetic desserts I kept thinking , this can't be right?”.*

#### **7.4.3 Theme 2 - Dietary management of Diabetes in practice**

It is relevant to note this tension in historical and current diabetes recommendations as there is evidence from the focus groups that it is in fact impacting on practice. While all of the facilities recruited from stated that they no longer had a ‘diabetic’ menu, all of the participants interviewed within the groups made reference to food practices more aligned with a traditional prescriptive diet for older adults with diabetes. This included the provision of diet cordials and desserts, or fruit based desserts instead of cake based options as well as mandatory sandwich suppers or modified serving sizes depending on what staff felt to be most appropriate,

*FG4 - “...there was one lady in particular...she would get very nasty about not being able to have what she wants so I just sort of dish it up, not say anything and if you just put it in front of her.. But if you gave her the choice, she'd always choose the wrong thing.”*

There seemed to be an unofficial hierarchy within the food service system in the RAC context, with

care staff assuming responsibility for the residents and ensuring their food choices were appropriate both at the time of ordering meals as well as meal service,

*"<Interviewer> and if they said 'I still want chocolate cake'? <FG1 response> give a small piece."*

This is at conflict with the ideal of a client centred approach. In contrast, food service staff felt they were at the lowest end of the organisational hierarchy in relation to managing older adults with diabetes and were noticeably underrepresented in these focus groups. Food service staff felt that they answered to care staff, in particular the registered nurses,

*FG4 - "well I go by what I'm told to do obviously because I've got no authority and whatever..."*

Dietitians were not mentioned by attendees regarding the day to day management of older adults with diabetes and food choices or food service diet codes.

#### **7.4.4 Theme 3 - The food service system**

Discussion amongst the focus group participants suggested that the general message that residents with diabetes could receive the standard menu had been implemented by food service staff but carers and nursing staff were impacting food choice and how much food was served outside of the kitchen. Conversely, most respondents noted that their facilities continued to offer artificial sweeteners in drinks, diet cordials or jams, and in some cases there was confusion over what menu changes had occurred,

*FG1 - "I'm not sure what they do here....there used to be a separate one for the diabetics".*

This may be in part due to the poor in house support of professional education and reliance on memos and verbal handovers to communicate widespread policy changes,

*FG4 - "I just picked it up as part of the handover".*

The only reference made to a dietitian in the management of diabetes was in referring because of weight loss. The care staff appear to be taking an active role in assessment and making food choices particularly with regard to management of diabetes blood glucose levels and hyperglycaemia,

*FG1 - "Look, you're better off having the other...have it this time but think about it for the next time and have the alternative"(Carer counselling a resident on food choices).*

This further reinforces the feeling of a hierarchy within the RAC food service system and contributes to inconsistent practices within facilities and between RAC providers.

## 7.5 Discussion

For 91% of older adults in RAC, this will be their home until end of life and food is a known key determinant for quality of life in this time <sup>(9)</sup>. For older adults with diabetes, diet is also traditionally viewed as a management strategy for the day to day management of blood glucose levels and prevention of hypoglycaemia and hyperglycaemia. It is evident from the studies discussed in previous chapters that implementation of a liberalised diet for older adults with diabetes has been variable and findings from this qualitative study with food service staff has again increased awareness of inconsistent practices in the dietary management of diabetes in RAC.

Overall the findings were linked to three key themes: education and knowledge of dietary management of diabetes; the impact of diabetes knowledge on practice; and diabetes management within the food service system context. Key findings were that there was tension between current knowledge of diabetes management and personal health beliefs, often informed by information they had received for their personal diabetes diagnosis or a close family member. The tension appears to be a persisting belief that sugar and sugary foods will cause hyperglycaemia, with none of the staff referring to carbohydrate counting or glycaemic load other than residents being '*careful*' with food choices and sometimes having '*treat days*'.

Opportunities for further education in diabetes outside of nursing qualifications were limited for most staff attending the focus groups. This may in part also explain the low attendance to all but focus groups 1 and 5, where staff were supported by the organisation to attend in work hours and this time contributed to their in house professional development '*points*'. The low attendance of food service staff such as cooks and chefs highlights the low value placed on professional development for this cohort as well as a lack of recognition within the organisation for the need for training and education. Currently there is no mandatory training for most of the roles within the aged care kitchen and no need for formal ongoing professional development as there is with nursing.

The issue of nutrition education and promotion of nutrition strategies with care staff in particular has been studied within the wider literature and consistently nutrition is recognised as an

important area for practice<sup>(178, 179)</sup>. However findings are that nutrition is either not a priority, or there is ambiguity as to whose role it is to monitor and manage nutritional issues. In addition new knowledge is not being well disseminated across the workforce<sup>(179)</sup>. In a separate study, many of the hospital care staff interviewed by Ross et al (2011) reported feeling disempowered to prioritise nutrition in their workplace<sup>(179)</sup>. There is limited similar research in food service staff, and as a profession they were grossly under-represented within the focus groups in this study. One paper that did examine food service staff satisfaction offers a consensus that this cohort may also be feeling disempowered, with low job satisfaction and high turnover in the aged care sector<sup>(171)</sup>. The disengagement with nutrition and lack of ongoing or new staff education has the potential to impact on all levels of the food service system and thus the quality of life of not just for those with diabetes, but all older adults in RAC.

As seen in this study, inconsistent and outdated knowledge of diabetes management still focused on restriction of sugar rather than carbohydrate consistency is potentially impacting the food choices older adults with diabetes are being offered or permitted to choose,

*FG1 - "we're offering them yoghurt instead of ice-cream... but I must admit the yoghurts are not sugar free".*

In addition, these residents may be further limited by portion sizes being amended based on the staff member and their perception of how suitable the meal item is for the individual. Even for those staff that have a good understanding of the liberalised diet the recommendations appear to be conflicted in their provision of a regular diet to residents.

The food service system itself is complex and encompasses all aspects of the RAC diet provision, from ordering and purchasing of foods, their preparation, ordering, delivery, mealtime assistance to waste disposal and quality assurance activities<sup>(38, 39)</sup>. While meals are generally planned for and prepared by cooks or chefs, ordering and meal service duties may fall to either food service staff or care staff. Currently there is no mandatory training for staff in aged care with regard to diabetes management and this study has highlighted the lack of institutional support for professional development in work hours. This is relevant as staff working in aged care, whether carers, nurses or food service staff, play a pivotal role in supporting residents in receiving their preferred meal choices as well as eventual consumption of them. This lack of training and recognition of the importance of nutrition as prevention and treatment of disease and malnutrition is detrimental to the health outcomes of older adults with diabetes in RAC, as highlighted in the results of this

study.

### **Strengths and Limitations**

Limitations of this study were the inability to reach data saturation through exhaustion of viable recruitment sites and participants willing to be recruited into this study. As a result food service staff were poorly represented in the focus groups. Ideally further research would target this group to contribute their ideas and influences on this topic. In addition, a generic limitation of all focus groups is the inability to maintain the direction of the group conversation to always be on topic which does mean the occasional introduction of irrelevant issues. However permitting a natural flow to conversation is important in ensuring all group members are heard and have the opportunity to share their experiences. Line by line coding of the transcripts means that all discussion is coded for emerging topics. A strategy for managing this in this study was to code all irrelevant conversation as 'incidental conversation' or 'context' and although counted in the total topics (n=20) were not included in key themes (n=3) and topics (n=13) presented in the analysis. This is consistent with agreed methods for inductive coding for qualitative research <sup>(65)</sup>.

A benefit of using a focus group methodology with a standardised interview guide did mean that the study could be repeated with intentional recruitment of the same cohort for comparison of further themes. The group interviews achieved in this study offer rich contextual information and offers more explanation of the intricacies of how components of the food system model interact with each other <sup>(39)</sup>. This study has identified potential barriers to the dissemination of any new advice or approach to the dietary management of older adults in RAC: in particular the in house support for ongoing education and attendance to regular updates or meetings. This poses issues for the introduction of any subsequent guidelines that may be developed for use in RAC and which would need to be considered in an implementation plan.

### **7.6 Summary**

In summary, while the menu is the blueprint for the food service system and is vulnerable to inconsistent guidance in its development, it is evident that the health beliefs of staff working in aged care and who are responsible for ordering and serving resident meals can also impact on the residents' meal experience. In particular staff may assume responsibility for initiating therapeutic diet orders or meal provision, which may not be in consultation with the resident or aligned with

current dietary recommendations. In addition, food service staff may not be influential within the food service system outside of the kitchen, often deferring to nursing staff on special diet provision to residents. This is noteworthy for future initiatives to disseminate new information. In addition it is important to acknowledge the significance of individual health beliefs that can impact practices. Staff interacting with residents with diabetes appeared to have beliefs which were still entrenched in dietary messages around low sugar diets and as a result were sometimes influencing older adults with diabetes food choices and meal serve sizes.

Quality of life, autonomy and choice have become key components of consumer directed care which are shaping the current landscape for modern aged care services. It is clear that the current best practice guidelines for food services in RAC are not being implemented broadly which may be in part to their not being mandatory. As a result older adults appear to be being offered a hybrid menu that incorporates some liberalisation, but as seen in this chapter and chapter five, still maintains some level of restriction either from the menu design or staff interference. Further to this practices amongst RAC staff appear to be heavily influenced by personal opinion and health beliefs, which for most staff, are not being challenged by education supported within the workplace and working hours. Chapter eight presents a study aimed at contextualising the impact of inconsistencies in 'controlling factors' and resources within a food system model, before seeking feedback from residents themselves in chapter nine.

# CHAPTER EIGHT – EXPLORING THE EXPERIENCE OF MEALTIMES FOR RESIDENTS WITH AND WITHOUT DIABETES IN RESIDENTIAL AGED CARE FACILITIES

## 8.0 Overview

The previous chapters have highlighted the discordance between policy and practice deriving from either guidelines not being acknowledged, or in their varied interpretation in practice; a potential lack of knowledge of revised recommendations for dietary management of diabetes amongst staff, but more often their hesitancy to implement a liberalised diet based on their own health beliefs. Chapter seven has highlighted that some staff involved in RAC food service continue to influence resident food choices or selection, and amend meals received by older adults with diabetes based on their beliefs. This study aimed to further explore food service practices at the service level through the observation of mealtimes to provide more context to the comments raised by staff in their focus groups, but also to observe resident and staff interactions.

## 8.1 Research Question

Does having diabetes change mealtime practices or interactions with staff in RAC?

## 8.2 Background

Food can be a source of comfort, life sustaining and in some instances therapeutic, such as in the MNT or dietary management of diabetes mellitus<sup>(180)</sup>. However, the importance of MNT in older adults residing in RAC has been questioned, with concerns raised that any form of dietary restriction is likely to impair adequate oral intake and increase risk of malnutrition<sup>(51, 68, 181, 182)</sup>.

This thesis has determined there is a lack of robust evidence in support of the liberalised 'diabetic' diet improving oral intake or quality of life (chapter three)<sup>(69)</sup>. Subsequent studies have also raised concerns that dietary management of diabetes in RAC is highly variable, with no consistent dissemination of clinician best practice guidelines (chapters five and

seven) <sup>(35)</sup>. The previous chapter has also highlighted the hesitancy of RAC staff in implementing a wholly liberalised diet to residents with diabetes, manifesting as either a hybrid menu that still has some low sugar offerings or staff limiting the available food choices and amending meal servings as they see fit. This conflict with how best to implement a liberalised menu is also mirrored in best practice guidelines for the management of older adults with diabetes discussed in chapter four, whereby added sugar is permitted in '*moderate*' amounts but meal items ideally withheld if deemed '*too sugary*' <sup>(34, 146)</sup> or suggestion that fruit juice would ideally be avoided <sup>(2)</sup>.

The transformation of controlling information (guidelines, menu goals and their philosophy) and human resources such as staff or physical resources such as food or ingredients, are an integral part of the food service model discussed in chapter 2. It is on this body of work that this research is framed, recognising that components have a multi-directional impact on each other and subsequently client satisfaction <sup>(39)</sup>. The output, in this case are the meals offered and should be aligned with the goals of the food service system one of which would ideally be meeting the nutritional needs of the RAC resident. However, it is evident from the studies discussed in earlier chapters that multiple factors at each stage of the system are impacting output, and potentially not only the oral intake, but also the satisfaction and quality of life of residents with diabetes.

This qualitative observation study was conducted to observe staff interacting with older adults with diabetes in RAC; the main purpose of which is to provide additional contextual information of the meal environment and (potentially limited) food offerings, and observe staff and resident interactions with respect to food and mealtimes. It is intended that this information will contribute to knowledge which could be drawn on for future aged care planning and inform the design of the final study discussed in chapter nine.

### **8.3 Method**

Observation is a systematic data collection approach often used in qualitative studies of social situations <sup>(66)</sup>. This method is useful in a number of ways such as checking nonverbal expression of feelings, how participants communicate as well as timings of various activities <sup>(183)</sup>. By using observation as a method, a more rounded understanding of a particular



phenomenon can be obtained within the appropriate context, although acknowledging researcher bias is important in maintain rigour. The position of the author was discussed in chapter two.

The meal observations in this study, were conducted to gain further understanding of the full food service system, how the meals are delivered and received by the resident and especially noting any different management of the residents with diabetes. This was of particular interest following prior exploration of the understanding of diet and diabetes for RAC staff and comments suggesting they would often amend meal requests or alter serving sizes to '*be more suitable*' for someone with diabetes (chapter seven).

Direct, or 'overt', observation can eliminate memory problems and inaccurate reporting that can be an issue with quantitative measure for food consumption; as well as biased or interpretative reporting of behaviour and interactions around food and mealtimes <sup>(66)</sup>. In this study the candidate overtly observed several mealtimes over two or three days, in the same dining room and with the same residents.

### **8.3.1 The Participants**

The inclusion criteria for the meal observation was only that participants resided in the RAC facility and were aged 60 years or older; ate in the main dining room, and were able to consent to being observed at the designated mealtimes. The age group for this study was broadened to include older adults 60yrs and over as it was identified by the recruitment sites that this was more appropriate for the cohort being studied. This avoided exclusion of some residents <65yrs present at mealtimes. For the observation study, participants were not required to have diabetes; although the researcher identified those with diabetes at the start of each mealtime in order to observe potential differences in practices with these individuals. Exclusion criteria for dining room observation included dementia specific areas where there was likely to be a higher proportion of older adults who required significant assistance with all aspect of mealtimes, from ordering to eating or who may be on texture modified diets.

### **8.3.2 Recruitment of the participants**

Convenience sampling was utilised to recruit older adults for observation. Former relationships with RAC's were used to negotiate five study sites across Adelaide which again represented different socioeconomic areas, organisations, food delivery and ordering systems and mealtime routines. The facilities assisted in identifying dining rooms suitable for observation and notifying residents and relatives that the study would be occurring: as well as providing an opportunity for residents who did not want to take part to 'opt out' for the days where observations would take place. RAC residents known to take their meals in the study dining rooms were also approached at mealtimes by lifestyle coordinators at the facility, with information regarding the study and asking for consent to the observation. RAC management circulated information on the study to all staff that were involved in food and meal service. Staff serving or assisting with meals at the time of observation were asked for consent to be observed before each mealtime commenced. This method of recruitment was ethically approved by the SBREC at Flinders University and written consent was obtained from all residents, relatives visiting, and staff assisting at observed mealtimes.

### **8.3.3 Data collection**

All observations were conducted by the PhD candidate. During the observations, field notes were taken using a standard template (Appendix 6) and which included identifying start and finish times, seating arrangements, lighting, atmosphere as well as conversation/interactions between residents and residents and staff relating to the meals. The template was modelled on a previously piloted observation form used in published acute care mealtime observations, with minor adjustments to suit the population and setting <sup>(184)</sup>. To try and reduce alteration of staff practices and changes in resident behaviour at mealtimes due to the process of being observed, the observer was present at more than one mealtime over three consecutive days <sup>(66)</sup>. Where feasible the researcher sat in unobtrusive areas in the dining room and did not move around the room during each observation or interact with the residents or staff during the mealtime unless directly addressed by a participant.

### **8.3.4 Data analysis**

The observation field note forms were reviewed and coded line by line, to extract key observations. Content analysis was used in this study, to identify key events noted in the field notes as observed by the researcher<sup>(175, 177)</sup>. The events were also then categorised into those that might have a positive impact on resident intake and those that might be perceived as negative for further discussion. The total number and type of events were calculated for comparison, as well as meal timings and number of residents with and without diabetes. All of which are described using descriptive statistics and analysed using the Statistical Package for the Social Sciences (SPSS Version 22.0)<sup>(166)</sup>.

In addition field notes narrative data was analysed assisted by QSR NVIVO qualitative analysis software (version 10)<sup>(174)</sup> to look for exemplar observations in support of the researcher interpretation. Observation data was reviewed by a second researcher (KW) and consensus was reached following discussion over suitable exemplar observations.

## **8.4 Results**

A total of 85 RAC residents were observed as part of this study, 17 male (20%) and 68 female (80%), of which 22% had diabetes (n=22). However, not all residents attended all mealtimes, in particular breakfast was often eaten in the residents' bedroom and similarly the evening meal may have been eaten in their room or on several occasions the residents were out with family members. Residents were recruited from five different sites, all of which utilised a cook fresh system for meal preparation and pre-plated the main meals either in the main kitchen or dining room kitchenette prior to being served to the residents. The meal timings and meal durations were similar between facilities and on average two members of staff served and assisted with meals, although this could vary between sites and the particular mealtime. Food service staff were frequently assisted by nursing staff (who may also have been administering the medication round) or care staff without nursing qualifications (Table 18).

Table 18 - Overview of Meal timings, duration and staffing between observation sites

Meal / (n= residents observed)		Meal Duration (minutes)	Staff Serving meals (Range n=x)
Breakfast (n = 51)	Mean (+SD)*	61±25	
	Median	61	2
	Range**	28-75	
Lunch (n = 85)	Mean (SD)*	44±6.9	
	Median	44	1-2
	Range**	15-58	
Evening meal (n = 75)	Mean (SD)*	53±15.3	
	Median	53	1-3
	Range**	24-70	

\*Mean/median for maximum time of meal duration only

\*\*timing of the first person leaving the dining room to the end of mealtime and all residents having left the dining room

### 8.4.1 Overview of observation dining rooms

The dining rooms varied in size, with the smallest rooms catering for only ten residents over 2 tables, to large dining rooms hosting over 20 residents at eight tables. Diagrams of the seating arrangements (not to scale) are in Figures 14-18 in addition to a brief description of each summarised from the field notes.

**Dining room 1:** The first dining room (Figure 14) was at the back of a single storey cottage style accommodation which housed ten residents and included a kitchenette where drinks could be made and breakfast and snack provisions were kept. The dining room had an adjoining lounge area with enough seating for four to six residents, a magazine stand and a wall mounted television which could be seen from the rectangle table but not the oval window table. The television was left on at mealtimes. The room had large windows overlooking a garden area across the back wall of the room which provided a lot of natural light. Overall the room was comfortably furnished in a modern but homely décor. A notice board with the date and upcoming activities was also displayed in this space. The tables were set prior to each mealtime with fresh flowers, placemats and cutlery but no condiments or beverages. Clothing protectors were offered to those residents requiring them.

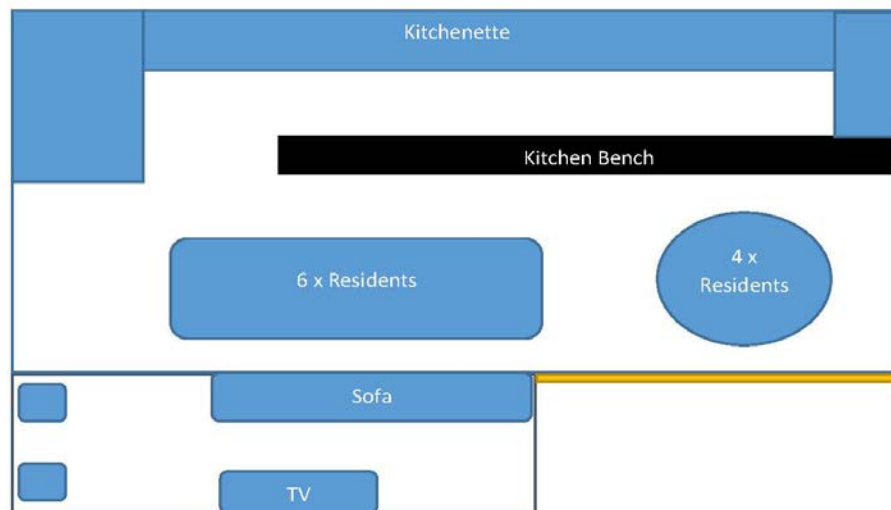


Figure 14 - Dining room 1 schematic, n= 10

**Dining room 2:** The second dining room observed was a second floor area, approached almost as soon as exiting the lift and before reaching resident bedrooms (Figure 15). The dining room had an adjoining pantry with cooking appliances although these were not used other than the microwave and toaster at breakfast. All main meals were brought to the pantry in a bain-marie by the chef from the lower level main kitchen. Breakfast was also pre-plated in the pantry onto trays. All meals were served from this room to residents in the dining room. Desserts were generally served from a trolley which was taken into the dining room.

The dining room was open to the corridor leading towards resident rooms on one side and had two large windows but insufficient light meant that artificial lighting was needed at all mealtimes regardless of the time of day. The walls either side of the pantry door displayed an activity and notice board and the date and temperature each day and a radio in one corner was playing at most meals observed. Tables were laid prior to each meal with cutlery, a cup and saucer and at main meals also included jugs of water and cordial, salt and pepper. Clothing protectors were offered to those residents requiring them.

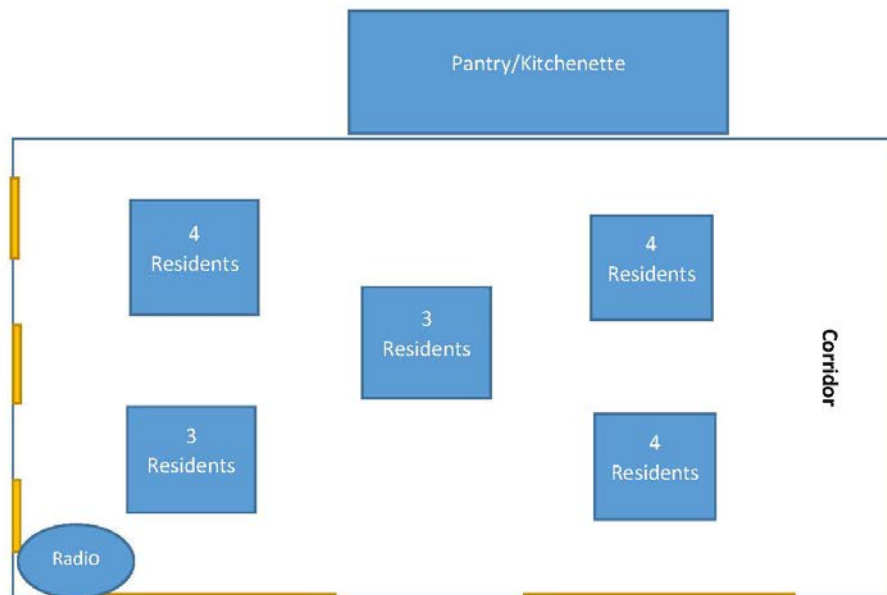


Figure 15 – Observation dining room 2 schematic, n = 18

**Dining room 3:** was also a second floor dining room and part of a recently built RAC, with all decoration appearing luxe and new. The dining room was one of two central dining rooms on the second floor either side of a corridor where a small kitchen was located. Meals were prepared in the central kitchen on the lower level and transported to the kitchenettes via bain-marie. The observation dining room had large windows on all four walls and high ceilings with a central corridor through the middle of the dining room leading to living areas and bedrooms (Figure 16). The kitchenette was not visible from dining room and the bain-marie was wheeled from the kitchen to the dining room for meal service, with meals plated and served directly to the resident. The room was decorated with homely touches such as a dresser, fresh flowers and a radio was playing at most mealtimes. The tables were laid with a 'lazy Susan' which held condiments such as salt and pepper, sugar and a milk jug. At some meals a water jug was also placed on each table. Residents' each had their name above their placement (plastic) along with a glass, paper napkin and cutlery.

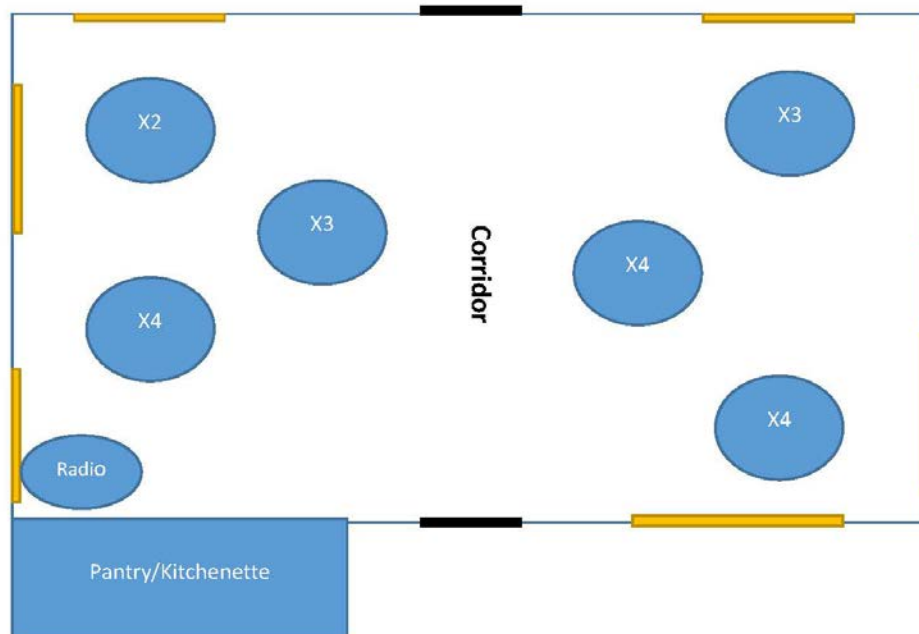


Figure 16 - Observation dining room 3 schematic, n=20

**Dining Room 4:** was in a single storey RAC with the dining room servicing residents within that particular wing. The room was large and split either side of an open kitchenette. Two of the walls had large windows overlooking a courtyard although artificial light was also required at all mealtimes (Figure 17). Both dining rooms were flanked by a corridor but whereas the smaller side of the room (near the radio) was not visible to the corridor except for in the doorway, the larger side of the room was exposed to the corridor by a half wall along the full length of the non-window wall. The radio was on at all mealtimes set to a ‘Gold’ music station but whereas the volume was quite loud for the smaller dining area it could barely be heard in the larger dining space. In the larger area a dresser sat against the back wall with flowers but otherwise the décor was plain.

The facility had newly implemented a pre-plated meal service from the main kitchen which arrived on a trolley and served to residents in no particular order. Tables were set with a tablecloth (these were not changed between meals even if stained), flowers, napkins and a placemat. Residents also had a placename, and condiments were available on the table but drinks were distributed with the meals. A large air conditioner vent was positioned over the two tables closest to the kitchenette (indicated by the star in Figure 16) in the larger dining room and contributed to significant noise in the room and residents frequently complained that it was too cold.

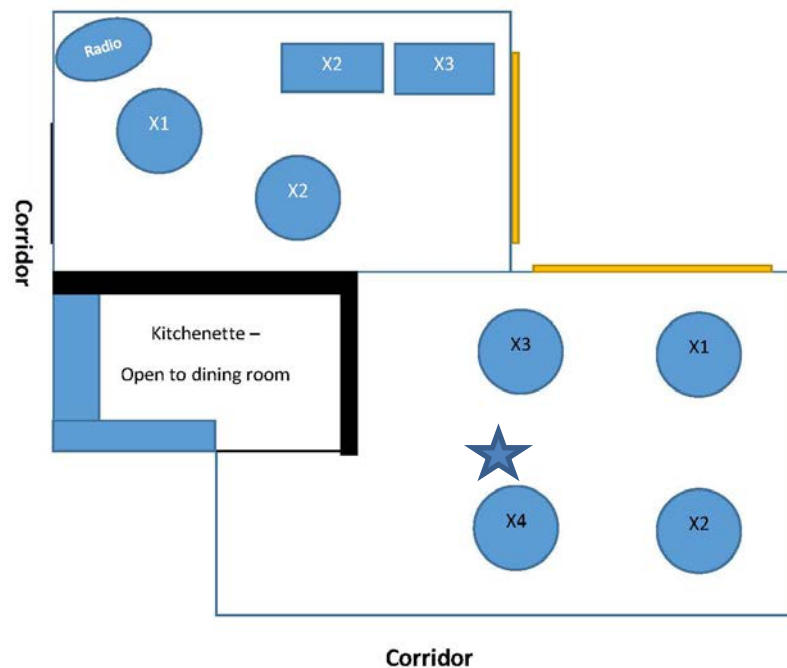


Figure 17 - Dining Room 4 schematic, n = 18



**Dining room 5:** the final dining room was within an independent RAC and is the only site belonging to the organisation (Figure 18). The dining room was located in the centre of the wing and serviced 20 residents. The room was somewhat divided by a corridor that ran diagonally through the centre of the room and past the kitchenette area. The kitchenette had a servery window into the dining room but was accessed via the corridor after exiting the dining room. The meals were transported from the central kitchen pre-plated and given to residents in no particular order at mealtimes. Natural light was provided by windows on almost all of the walls, with the left hand side of the room also providing a double door access to a courtyard although these doors were not opened at mealtimes. There was no radio or television in the room. Tables were laid with fake flowers and placemats, name cards, cutlery and water glasses. Both usual condiments such as salt/pepper as well as culturally specific condiments were provided on the table (country omitted to avoid identification of the RAC).

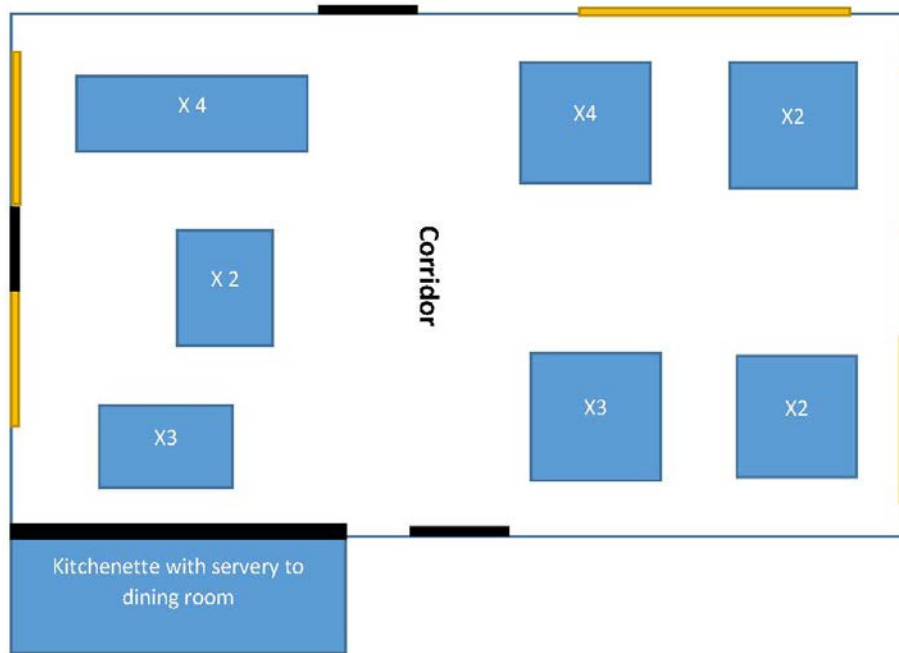


Figure 18 - Dining room 5 schematic, n=20

#### 8.4.2 Observations

Following thematic analysis, the observation records were summarised under three key themes and comprising of 18 topics. Each are presented with an exemplar observation for the topic in Table 19. The three key themes identified were: food service, dining experience and mealtime interruptions. Despite the initial study aim being to observe differences in practice towards residents with and without diabetes, very few incidents were observed. In total only six observations were noted that specifically related to diabetes management. Of the six, four were considered negative interactions which support prior findings that food may be more likely to be withheld from residents with diabetes. Positive interactions were associated with collaborative discussion regarding diabetes management between the resident and staff member. However, the four negative observations were associated with either staff not offering a resident a dessert, the resident themselves refusing the dessert and two occasions where no alternatives were offered when the dessert presented was not eaten (whereas other residents may have been offered ice cream). Overall though the observations that were recorded highlighted many occasions where food service practice was not optimal for all residents not just those with diabetes.

Food service observations frequently related to a lack of reactivity to resident behaviour or recognition that nutrition is important. Mealtimes were frequently hurried,

*Observation: All residents now wanting dessert have it on the table, but all still eating mains (hot dessert with custard).*

And staff rarely reacted to meals that were uneaten, infrequently offering second helpings or alternative options and often disregarding how their 'hurried' meal clean up might be influencing the meal experience for residents. The dining experience was noted as not particularly social, residents were provided with assigned seats and these were adhered to regardless of whether multiple tables had lone diners at particular mealtimes,

*Observation: Assigned seating is usual – noted in one facility, across three tables with only one occupant each, all residents seated in a way that they cannot interact with each other (facing away from each other) or with their back to the window and looking out into a dark corridor.*

More positive dining experiences were associated with occasions where mealtimes were

individualised, for example with the provision of personal mugs for hot drinks or where the ambiance was more home like. This was achieved not only with the decoration but more simply with provision of condiments and jugs of water for self service or even through having the news on television during breakfast. Mealtime interactions were also noted to greatly influence resident dining. Comradery between residents was noted as particularly important in residents lingering over meals as well as conversations with staff and visitors. Unfortunately it was frequently observed that food service staff were not conversational with residents, particularly in relation to their meal and volume of food eaten,

*Observation: If residents don't eat their meal they are not offered an alternative – plates often cleared without comment.*

Despite this, overall more positive events (n=170) were observed than negative events (n=133). However this still equated to 44% of the observations considered potentially detrimental to oral intake. Content analysis for the number and type of interruptions or events that might impact dietary intake were also recorded and categorised in Tables 20 and 21.

Table 19 – Key themes and exemplar observations

Key Theme 1: Food service	Exemplar Observation - positive	Exemplar Observation - negative
1.1 Meal preparation	<i>Staff serving breakfast note to a trainee that they need to learn how each person likes their breakfast (folder of written preferences) as otherwise residents get irritated if you keep asking</i>	<i>Breakfast trays in pantry pre-plated (based on resident preferences stated at time of admission) and labelled with resident name and a sticker if resident has diabetes – residents have to ask for different options on entering the dining room (choices not visible to them)</i>
1.2 Meal ordering	<i>Food service staff taking orders remembers to ask one table if they would like a glass of wine with their meal</i>	<i>Food service staff collect food orders for next day, main course preference taken but not asked about choice of starch or vegetables (selected for them)</i>
1.3 Meal timing	<i>Meals are served to each table in anticlockwise direction, courses served separately</i>	<i>All residents now wanting dessert have it on the table, but all still eating mains (hot dessert with custard)</i>
1.4 Meal clean-up	<i>Plates are taken as residents are finished and stacked on a trolley for returning to the kitchen</i>	<i>Dishwasher being stacked noisily in kitchenette, lots of banging and crashing of cutlery etc... Very loud in dining room, gives impression of 'frantic busyness'</i>
1.5 Food restriction	<i>Food service manager notes at meal service that soft meal has been sent with unsuitable items and rectifies before resident receives it</i>	<i>All residents have received soup but no-one has been offered bread despite 2 loaves of bread in the fridge</i>

1.6 Food waste	<i>Leftover sandwiches are put in the fridge in case they are wanted later</i>	<i>12 mins into lunch service – Table 1 are finished (hot meal or sandwich), significant waste from meals cleared without comment</i>
1.7 Interruptions to service	<i>Cleaner pops her head into the dining room and greets a table, spends ~5 minutes chatting to residents about their day/family. Residents seem happy to engage.</i>	<i>Missing meals: Lady on table 4 still waiting for her meal, her companions joke that she's saving hers until tomorrow', the other ladies on the table have all finished their meals.</i>

<b>Key Theme 2: Dining experience</b>	<b>Exemplar Observation - positive</b>	<b>Exemplar Observation - negative</b>
2.1 Seating	<i>Resident from table 5 moved to table 2 to accommodate residents' visitors – she comments that she is happy to move as this table is more social at mealtimes.</i>	<i>Assigned seating is usual – noted in one facility, across three tables with only one occupant each, all residents seated in a way that they cannot interact with each other (facing away from each other) or with their back to the window and looking out into a dark corridor</i>
2.2 Waiting behaviour	<i>Resident asks if they can turn the television up for the news headlines – 1-2 people watching T.V.</i>	<i>Those not engaging in conversation demonstrating 'waiting behaviour', either staring at a fixed point or concentrated on their meal or drumming their fingers</i>
2.3 Comradery	<i>Resident asks lady next to her to help cut up her meal, others offer encouragement with taking medication or eating their meals</i>	<i>A resident is coughing due to swallowing issues, at the mealtime, many residents look unhappy and one resident shouts 'that's enough!'</i>
2.4 Independence	<i>Table settings at one facility include a 'lazy susan' with condiments, milk jug and sugar – residents can prepare their own hot drinks when pot of tea arrives/or served coffee</i>	<i>Residents are reliant on food service staff for all drinks and condiments – nil provided on the table for self service</i>
2.5 Individualised meals	<i>Residents have their own mug (patterned) for drinks, carer fetches mug from the residents' bedroom</i>	<i>One resident is upset that her request for a different sandwich filling has not been actioned and refuses meal</i>

<b>Key Theme 3: Mealtimes</b>	<b>Exemplar Observation - positive</b>	<b>Exemplar Observation - negative</b>
<b>Interactions</b>		
3.1 Visitors	<i>Relatives visiting for lunch or RAC staff passing through the dining room often stimulate more conversation in the dining room</i>	<i>Nil negative observations</i>
3.2 Nursing staff interactions	<i>Drug rounds commence and nurse spends time explaining medications to a resident and encouraging with eating and drinking</i>	<i>Drug round continues, one resident is administered eye drops during the meal</i>
3.3 Mealtimes assistance	<i>Residents are assisted to the tables and with clothing protectors if wanted</i>	<i>Carer comes in and then leaves again 'back in a min' – returns few minutes later and commences feeding assistance, all other residents are midway through meal</i>
3.4 Food refusal	<i>Staff check a resident 'Are you finished, are you sure? You've hardly eaten anything.'</i>	<i>If residents don't eat their meal they are not offered an alternative – plates often cleared without comment</i>
3.5 Resident satisfaction	<i>At several main meals, the cook assists with serving and checks resident satisfaction</i>	<i>One resident frequently claims the meal was cold when asked by staff, acknowledged but without sincerity</i>
3.6 Diabetes	<i>No restriction of dessert selection for residents with diabetes</i>	<i>Nurse on drug round queries why resident with diabetes has received cake – comments that she will have to give insulin for blood glucose levels</i>

Table 20 - Observed events that may positively influence dietary intake

Activity	Total Observations (n=170)	Breakfast (n= 46)	Lunch (n=77)	Evening Meal (n= 47)
Meal Preparation	5	3	1	1
Meal ordering	5	3	1	1
Meal Timing	8	4	2	2
Meal clearing	11	1	7	3
Food offerings	12	3	6	3
Comradery	31	5	15	11
Background noise	10	3	4	3
DM management	2	0	1	1
Independence	12	6	4	2
Individualised meals	26	8	7	11
Staff/Visitor Interactions	48	10	29	9



Table 21- Observed events that may negatively influence dietary intake

Negative events	Total (n= 133)	Breakfast (n= 22)	Lunch (n= 73)	Evening Meal (n= 38)
Meal Preparation	7	4	1	2
Meal ordering	4	2	1	1
Meal Timing	21	1	15	5
Meal clearing	16	0	12	4
Food offerings	28	4	15	9
Comradery	8	0	6	2
Background noise	10	1	6	3
DM management	4	2	2	0
Independence	3	0	1	2
Individualised meals	8	3	0	5
Staff(only) Interactions	24	5	14	5

Abbreviations: DM = diabetes mellitus

#### 8.4.3 Observations which may negatively impact oral intake

Negative events were most frequently attributed to themes of food offerings (n=28); staff interactions (n=24); and meal timing (n=21). This particularly related to food not being offered when it was available e.g. dessert components left on the trolley and not offered, or meal alternatives not being offered when meals were cleared untouched or mostly not eaten. In addition, the lack of staff interaction with residents at mealtimes was noted as a negative event, with some meals passing with no interactions between staff and resident at all. In addition, meals whereby all courses were set down on the table at the same time or plates cleared as soon as resident paused in eating were considered negatively. These events were considered to impact the

desire to linger over mealtimes and therefore potentially detrimental to oral intake. As seen in Table 18, for some residents mealtimes were only lasting ~15minutes, whereas the average time spent in a mealtime for others was closer to an hour. More minor events were staff interruptions (n=24) where staff had to leave the room mid meal service or were slow to assist with feeding; or less frequently due to invasive drug rounds requiring blood samples to be taken or eye-drops administered during the mealtime.

Background noise was considered a negative event when it was from loud air conditioning units as well as noise from meal clean up, generally from excessive noise of staff rinsing cutlery and stacking the dishwasher when it was located in the dining room or pantry area. The meal clearing (n=16) was frequently considered to not contribute to a positive eating environment as in addition to the noise, plates were often cleared rapidly without comment to the resident, which was noted as creating an air of urgency in the field notes.

#### **8.4.4 Observations which may positively impact oral intake**

Conversely, positive events that were observed as having the potential to improve oral intake were any events that created a more social dining experience, such as staff and visitor interactions (n= 48) and comradery between residents (n = 31). Within these observations, interruptions from staff on medication rounds, which might usually be considered a negative impact on mealtimes, were seen as positive as this was often the only social interaction of staff with residents during the mealtime. Staff administering medication rounds were often noted as affectionate, sociable and concerned for resident welfare and residents seemed happy to engage with staff at these times.

Comradery was observed in residents helping each other with their meals and was particularly enhanced where an element of independence was facilitated (n=12), such as teapots or water jugs on the table, or talking points such as activity schedules or menus. Residents were observed as being more satisfied when meals were individualised to accommodate their preferences (n= 26) and where alternative meals or foods were offered (n=12). Another unexpected observation that enhanced the mealtime experience was background noise from a television (n=10). Residents who were observed as not engaged in social dining and exhibiting 'waiting behaviour' such as fidgeting or gazing at fixed spots, seemed less anxious and lingered longer over meals where a television was on quietly and could be viewed from the dining table. This also added to a home-like feel of the dining environment particularly in the cottage setting in the first observation.

## 8.5 Discussion

This study observed typical mealtimes for older adults with and without diabetes in RAC. While the aim of the study was to examine potential differences in practices for older adults with diabetes as compared to their peers without diabetes; very few instances of differentiation were observed. In total, six observations relating to diabetes management were observed, four of which were deemed negative or more aligned with historical practices. This included restriction of desserts by staff or refusal of desserts by residents with diabetes and no alternative offered by staff. However a number of other events that could negatively or positively impact the oral intake of all residents were noted with more frequency, and summarised under key themes of food service, dining environment and mealtime interactions.

### Food service

The food service system observed across the five sites was similar, with food service staff mainly being responsible for the delivery of meals to the dining room or kitchenette, distribution and clearing of the meals. Care staff or nursing staff were generally available to assist but more often were juggling multiple tasks such as drug rounds, feeding assistance and more commonly assisting residents to and from their rooms. Most mealtimes operated well with two to three staff members, and in the smaller dining rooms one member of staff was sufficient as meals were mostly pre-plated (n= 4 facilities). While pre-plated meals or known food preferences were valued by residents in one facility, elsewhere observations were that frequently known preferences inhibited opportunity to offer choice. This was particularly evident at breakfast where menu best practice guidelines states at least 3 cereal choices should be available <sup>(34)</sup> and yet residents are served the same breakfast daily unless otherwise requested. Alternative options were notably available in the kitchen but not advertised to the residents. Considering that positive observations for facilities were in those that promoted independence through self-service at mealtimes, it would seem that breakfast might be an ideal opportunity to present choice of cereals on tables with potential to increase satisfaction with meals, as well as encouraging independence and comradery between residents.

Meal timings were a main concern for negative impacts on oral intake and despite average length of mealtimes being 50-61 minutes in duration (Table 18) not all residents were staying that long

particularly where all meal courses were often being served together onto the table, and all served within the first 20 minutes of meal service. The clearing of plates as soon as residents were finished and the loud noise of plates and cutlery being rinsed and stacked in some dining rooms increased a sense of hurried mealtimes. These were not observed to be encouraging of a social and pleasurable eating occasion. This was further exacerbated by residents not receiving alternative meal offerings or any comment when plates were cleared relatively untouched. Similar negative experiences have been documented in other studies in RAC <sup>(184-186)</sup> and are attributed to lack of staffing or education of staff, which results in nutrition and mealtimes not being considered important to resident care. Lindeman et al (2003) identified barriers to good mealtime practices in their study, and in the implementation of a pilot program, 'The Well for Life project'. The study found that empowering staff to recognise nutrition as important and translating this to facilitate change in practice could be achieved through education and increasing awareness and understanding of the importance of nutrition <sup>(187)</sup>. However, chapter seven has highlighted challenges for disseminating new information and upskilling staff where this education is not supported in work hours.

### **Dining environment**

There is consensus in the literature that the dining environment is an important factor in achieving a social mealtime which can enhance oral intake <sup>(184, 188, 189)</sup>. Most residents ate in the dining rooms for main meals (excluding breakfast where some ate in their rooms) and all rooms had assigned seating. Although the rationale of assigned seating may be in part influenced by functional dependence of each resident, generally it is hoped that some thought would be given to promoting social dining through seating arrangements. Observations in this study demonstrated variable success, but on a number of occasions assigned seats resulted in several tables with lone residents who were positioned with backs to windows, or other tables and therefore other residents. Rather than this being an issue with assigned seating however, it may actually further illustrate a lack of responsiveness by staff and their understanding of what impact this aspect of the dining experience could have for residents. This therefore had potential to impact residents' oral intake, much like the lack of food offerings in addressing food refusal and overall hurried mealtimes. Increasingly findings of the observation study were highlighting that it was not only residents with diabetes that were at risk of poor oral intake, but all residents.

## **Mealtime interactions**

The social dining experience was further examined in the observation of interactions and interruptions to mealtimes. In contrast to literature examining practices in acute care where drug rounds in particular have been found to negatively impact on oral intake<sup>(184, 190)</sup> observations from this explorative study have highlighted that in the absence of other social stimulation, familiar nursing staff offering conversation during this time can be viewed to positively impact resident mealtime experience. Similarly, background noise from a television was more often viewed as a positive event, as this reduced impatient, anxious or bored waiting behaviour before and during mealtimes. Comradery was seen to positively enhance mealtimes, particularly where the meal and dining table was set up to facilitate some independence in tasks such as pouring drinks for each other and passing condiments. Maintaining a sense of identity and independence is thought to promote resident satisfaction in RAC<sup>(180, 187, 191)</sup> and yet only two of the five observation sites actively facilitated some independence at mealtimes.

## **Strengths and limitations**

This study relied on a convenience sample of residents with sites that the researcher already had relationships with from earlier studies conducted as part of this thesis, which may limit generalisability of findings. However, the study did achieve observation of 85 residents over the five sites, none of which had had contact with the candidate prior to this study or were chosen specifically to study, which could be considered a strength for a qualitative study of this nature.

Observations were overt, which is also a limitation of this study design, as staff and residents are all aware of the candidate/researcher being present and the nature of the study. This can mean that practices and behaviour are changed during this period. Repeat observation over three days was conducted by the same researcher with the aim of familiarising participants with the researchers' presence and therefore reduce inhibition of usual behaviour. Also the candidate used a standard field note form as a means to reduce bias that this could have introduced and strengthen the reliability of data collected. Finally, constant comparison of common themes and ongoing recruitment of observation sites until data saturation was reached, suggested sufficient data had been collected to adequately explore key themes and topics to address the research question. Although the interpretation of the key themes were initially collated by the primary researcher and candidate (OF), a second researcher (KW) verified the themes, topics and exemplar

observations, with consensus being reached to enhance inter-reliability.

## **8.6 Summary**

This qualitative observation study of five RAC sites and their mealtime practices has highlighted that while diabetes knowledge and management is negatively impacting some residents' mealtime experience: a significant number of other events are likely to be having an impact on oral intake and quality of life for all residents, not just those with diabetes.

Chapter seven highlighted that staff knowledge of diabetes management was conflicted and sometimes out-dated contributing to food items being withheld at service level or not included in the menu design for residents with diabetes. While this was observed in practice on only a few occasions in this study, it was noted that other events within the food service system can more frequently create opportunity for dietary restriction, and are not limited to those residents with diabetes. Practices such as advance meal preparation based on assumed preferences, and poor meal ordering practices which limit food choices; inadequate management of food refusal and meal satisfaction; as well as a lack of social dining experience can all contribute to poor oral intake of older adults in RAC and were observed with frequency in this study.

All of the studies discussed so far in this thesis have been related back to older adults with diabetes in RAC. However, it was on reflection of the findings from this observation study in relation to the previous chapters that it became apparent that many of the recurrent themes arising in the discussions are indicating that lack of mandatory controls for RAC have potential for wide reaching impact on the food service system and therefore for all residents. Chapter nine is the final study which sought to understand the experience of diet and diabetes for current RAC residents, their own health beliefs and importance of ongoing diabetes management or incorporating usual practices familiar from before entering RAC. In addition chapter nine seeks to understand the wants and needs of baby boomers as they look to their own preferences for support in ageing and chronic disease management.

# CHAPTER NINE – EXPLORING THE WANTS AND NEEDS OF OLDER ADULTS WITH DIABETES AND THEIR DIETARY MANAGEMENT ON TRANSITIONING INTO RESIDENTIAL AGED CARE

**Presented as an oral presentation:**

British Society of Gerontology 44<sup>th</sup> National Conference, 2016. Farrer, O., Yaxley, A., Walton, K. & Miller, M. *Do all Older Adults Want to Eat Cake?* Stirling, UK.

## 9.0 Overview

The previous chapters have used a sequential explanatory approach to exploring the policy and practices around diabetes management in RAC. The studies have used a revised food service system model based on a design by Lengyel et al <sup>(39)</sup> as a framework to approaching this research. Early chapters have highlighted the discordance between physician guidelines for diabetes management and aged care specific best practice documents. Studies within this thesis have highlighted how a lack of mandatory guidelines is manifesting as inconsistencies in menu design and delivery at all stages of the food service system. Up until chapter eight the studies were primarily focused on the impact this may have for older adults with diabetes and their medical outcomes and quality of life. However, chapter eight presented findings that highlight the potential risks to optimal intake for all residents not only those older adults with diabetes based on observed typical mealtime practices in this setting.

This chapter discusses the sixth and final study, which explores the evaluation component of the food service model: as a good model must be an open system and receptive to feedback <sup>(39)</sup>. In addition, the chapter presents a ‘where to from here’ perspective predominantly focusing on the needs of older adults with diabetes. An unexpected finding of this study was the reach of the issues raised, which like the findings in chapter eight, may also impact on quality of life for all older adults in RAC not just those with diabetes. The final research question aimed to examine the experiences, wants and needs of older adults already in RAC with diabetes, while also identifying what older adults not yet accessing aged care services may expect and want in the future.

## 9.1 Research Question

What is the lived experience of older adults with diabetes and diet in RAC, and how do baby boomers perceive their needs will be met as they look to the future?

## 9.2 Background

The current Australian aged care sector operates on a philosophy that views older adults in RAC as vulnerable and for whom they have a duty of care, measured through objectively assessed care needs. This model has a long history, dating back to post World War II, where less people reached old age and those that did held low expectations<sup>(192)</sup>. Prototypes of modern aged care homes were modelled on benevolence homes for the sick, the poor and neglected, and run by the church or other not for profit organisations<sup>(192)</sup>. Government attention to RAC policy development did not happen in Australia until 1969-1970, which saw the introduction of legislation for home care and meals services; although these were still funded through state based grants and relied on voluntary service within a welfare model<sup>(192)</sup>. In 1986 a review of nursing homes and hostels led to further review and RAC being separated from hostels to operate under a 'health' framework, with places allocated on referral and on a medical or functional needs basis. This model still somewhat exists with functional assessments or ACAT's (Aged Care Assessment Team) often being determined during an acute care admission i.e. after a fall, and may result in RAC placement occurring at the next available site, rather than individual or family preference<sup>(193)</sup>.

However, this approach is somewhat at conflict with the shifting paradigm towards client-centred values and client perceived health and social needs<sup>(194)</sup>. The newly created home care packages developed as part of CDC are a step towards older adults determining which services are of most importance as they age at home<sup>(195)</sup>, and ideally there should be a flow on effect whereby older adults have a similar experience in RAC services. Currently there is a lack of evidence examining what older adults might want or look for from CDC packages in the home or from RAC facilities<sup>(196)</sup>, and particularly in relation to diet and nutritional management of disease and comorbidity.

The move to RAC has been identified as the most significant relocation affecting older adults particularly as it is often preceded by declining health or death of a spouse<sup>(191)</sup>. Admission to RAC can create many interruptions to usual behaviour<sup>(173)</sup>, and in the context of this study, could include food choices, health self-management and dining norms. A previous study of how older



adults experience moving into RAC found that generally new residents used passive acceptance to make the best of available choices, often applying control over activities such as self-care that they could manage: exercising choice over when to go to bed or engage in social activities and finally in stocking up on favourite foods where possible <sup>(191)</sup>.

The way in which older adults approach ageing will be heavily influenced by the period of time in which they have lived their later years and the core values and orientations they have formed in their adult lives <sup>(192)</sup>. While the largest cohort in RAC is currently is the oldest-old over 85yrs, the rising cohort of baby boomers present new challenges in how to support constructive ageing. The current oldest old have lived through significant periods of adversity, often where choice was not prevalent for any but the most affluent. Baby boomers are typically characterised as adults born between years 1946 – 1965. Conversely, the baby boomers have lived through a more prosperous and socially stable time, where choice has been abundant and accessible to most. It is generally accepted that this population will be wealthier and better educated older adults than previous generations <sup>(5)</sup>.

In another study looking at how baby boomers are pursuing healthy ageing now, diet and exercise were the most common responses <sup>(197)</sup>. Community based health education particularly for nutrition management of conditions such as obesity and diabetes, are built around the importance of self- management and individualised care plans <sup>(2, 198)</sup> generally promoting a healthy weight and flexible diet choices. It is evident that dietary practices for this cohort in RAC facilities are highly variable <sup>(35)</sup>, with some menus modelled on traditional dietary restrictions and others having a malnutrition focus, but often with a ‘one size fits all’ approach (Chapter five). This raises questions as to how CDC principles might flow on into RAC and how health professionals might adapt to supporting older adults in this setting.

Currently there is a lack of literature discussing the expectations of ‘baby boomers’ for their health and healthcare with regards to the importance of autonomy in self-care in ageing. Focus groups have become a popular method by which to extract views and experiences of particular services, particularly in health research <sup>(55, 62)</sup>. A major strength of qualitative research and focus group methodology, is the ability to examine the phenomenon, in this instance ‘transition into RAC’ and ‘aged care expectations’ whilst also providing context and meaning of these experiences <sup>(54)</sup>. The approach does assume some commonality in the experiences described but rather than focusing

on a shared experience in the true sense of phenomenological research, rather the study described in this chapter employs a perspective which acknowledges researcher interpretation in which findings can inform and support theorem that may in turn inform policy <sup>(54, 199)</sup>.

Therefore the aim of this qualitative study was to examine the transition experience and wants and needs of older adults with diabetes currently residing in RAC. A second aim of this study was to compare findings from residents, to wants and needs expressed by baby boomers in the community (with diabetes) who are not yet accessing aged care services; specifically exploring what would determine a good quality of life in ageing.

### **9.3 Methods**

Participants were invited to one of a series of focus groups for people with diabetes, lasting for 45mins -1hr maximum. They were held at either a city based location for community based older adults or within the facility for aged care residents. Inclusion criteria were only that the older adult be aged over 60yrs (based on WHO definition of 'older adult' in developed countries, and to increase participant scope) and diagnosed with diabetes mellitus; type 1 or type 2, and who could converse in English and consent to participating in the study. The focus groups were recruited for on a sequential basis and progressively analysed using an inductive process until data saturation was reached <sup>(65)</sup>. The study was granted ethics approval by Flinders University SBREC and therefore complies with the Declaration of Helsinki.

#### **9.3.1 Recruitment**

Participants were recruited via a third party or proxy for the researcher as recommended by the ethics committee to remove potential coercion in attendance and also influences on participant discussion. Recruitment of community based older adults with diabetes was via flyers only, distributed in education sessions held by charitable organisation, Diabetes South Australia (DSA), at their meeting rooms in Hilton, Adelaide or via their electronic newsletter to DSA members. For recruitment of older adults already in RAC; facilities with whom the researcher had an established research relationship were approached and residents received either verbal notification of focus groups from staff or written information in the form of a flyer or both.

For both community based and older adults in RAC, the advertisement contained similar information pertaining to the nature of the focus group, date and time and participants were

asked to register their interest directly with the candidate or their proxy. Study information and a list of questions to be explored were provided to interested parties prior to their consent to participate (Appendix 7).

### **9.3.2 Data Collection**

Following consent and prior to the focus group starting, participants were asked to complete a short de-identified survey of demographic questions (Appendix 8). Figure 19 outlines the interview guide used for focus groups with both older adults in the community setting and those in an RAC. Focus groups were digitally recorded and transcribed verbatim for thematic analysis, in conjunction with field notes kept by the researchers.

The focus group was conducted by 1-2 researchers (one of which was always the candidate OF & supervisor KW) each time to maintain consistency in format. Although the question guide received by participants was used as the main guide for conversation these were not inflexible, and other relevant conversation points were not diverted. General feedback questions were posed to residents of RAC, which were developed from findings reported on in chapters seven and eight (Figure 19). Such questions included feedback on meal timings, food choice, acceptability of meals and the dining environment. Additional questions for both groups focused on how participants felt about the importance of autonomy in diabetes management as they age, and their usual food and nutrition habits both in independent living and where appropriate in supported living, for those in RAC.

**General questions to both cohorts:**

How long have you had diabetes – when were you diagnosed/type 1 or 2?

Roughly in months/years

Have you had any education on the diet for Diabetes?

What were the general recommendations e.g. GI, sugar, carbs etc...

Who gave you the advice

Was this advice important to you/did you make any changes?

How important is your diet and diabetes management to you currently? Do you perceive this to change as you age?

In a perfect world, what would make an ideal food service for you <if you were receiving meal services>?

Mealtimes / location of mealtimes / variety of meals / cooked on site?

**Residential aged care specific questions:**

Have you noticed any change in your weight or diabetes management since moving here?

Do you know why things may have changed (if appropriate)?

Are you eating more/less/change in medication etc...

Were you taking any nutritional supplements before coming into <insert name of facility> and do you still take them?

How do you feel, in general, about the food choices you are offered here?

Are the choices similar to foods you ate before coming into the facility?

How do the meal/snack timings and serve sizes compare to before you moved here?

**Community specific questions:**

Currently, do you live with anyone?

Who does the cooking and shopping?

How much does the media or your own research of nutrition affect your eating style / choice of foods? E.g. superfoods, low GI, no sugar diet?

What is your understanding of this and is this to benefit your diabetes/whole health/weight more so?

Do you take any nutritional supplements currently?

What benefits do you feel you receive from these?

How important is it that an aged care service e.g. meals on wheels / residential care, considers how you eat now?

Would you want your food choices to be similar to foods you have now?

*<if appropriate based on previous answers>* How important would it be that 'superfoods' / low sugar foods or supplements be offered or incorporated into the menu?

How important is your diet and diabetes management to you currently?

How important do you feel it will be in 10yrs time? Scale of 1-5, 1 being most important and 5 being least important?

And the same question for if you can imagine you are living in a residential aged care facility – how important would maintaining similar eating practices and diabetes management be at this stage of your life – 1-5 rating

Figure 19 – Question guide available to the focus group coordinator for community and residential aged care cohorts

### 9.3.4 Data Analysis

Participant demographic and medical history data was analysed descriptively and variations between group characteristics were determined through analysis of categorical data using Chi Squared calculations in SPSS (version 22) <sup>(166)</sup> and assuming significance when  $p = <0.05$ .

The transcribed qualitative data was reviewed by the researchers on a number of occasions for the purposes of familiarisation with the data before being analysed using an inductive approach and with reference to the method discussed by Braun and Clarke, described in chapter seven <sup>(64)</sup>. This approach was selected to best identify a subjective view of the participant experience of diabetes and diet while acknowledging researcher bias. Analysis of the transcripts was facilitated by the use of software package QSR NVivo (version 11) <sup>(200)</sup>.

Line by line coding was completed independently by the PhD candidate and a second researcher (KW) to identify topics and themes before these were discussed, refined and collapsed and until consensus on the key themes with exemplar quotes were reached between both researchers.

## 9.4 Results

### 9.4.1 Characteristics of respondents

Table 22 provides an overview of the 16 community based older adults with diabetes and 18 RAC participants with diabetes. More than half of the participants were female in both cohorts, with no significant differences in nationality or type of diabetes between groups ( $p = 0.660$  and  $p = 0.122$  respectively). Non Australian born residents were primarily British or European heritage. A significant difference in age groups were seen between the cohorts which is to be expected within RAC participants typically being  $\geq 85$  yrs ( $n = 13$ ), whereas community based older adults were more frequently aged 65-74 yrs ( $n = 7$ ). Older adults with diabetes still residing in their own home in the community were more likely to have completed higher education ( $n = 3$ ) than older adults in RAC, ( $n = 0$ ). More than half of all older adults in RAC had received education on their diabetes management ( $n = 12$ ), whereas almost all older adults with diabetes in the community ( $n = 15$ ) had received diabetes education (Table 22). Most frequently more than one health professional that provided advice, although the young-older adults (65-74 yrs) in the community were likely to seek out their own information as well.

Table 22- Demographic characteristics of focus group participants – Older adults with diabetes living in their own home compared to residential aged care

	Community based participants (n = 16)	Residential aged care participants (n=18)	P value
<b>Age (years) n (%)</b>			
<65	1 (6)	1 (6)	0.047
65-74	7 (44)	1 (6)	
75-84	3 (19)	3 (16)	
≥85	5 (31)	13 (72)	
<b>Gender n (%)</b>			
Male	6 (38)	7 (39)	0.934
Female	10 (62)	11 (61)	
<b>Born in Australia n (%)</b>			
	8 (50)	7 (64)	0.660
<b>Type 2 Diabetes n (%)</b>			
	14 (88)	18 (100)	0.122
<b>Level of Education* n (%)</b>			
Year 10	3 (20)	7 (41)	<b>0.013</b>
Year 12	1 (7)	1 (6)	
Trade qualification	5 (33)	8 (47)	
Degree or Postgraduate qualification	3 (20)	0	
Other	3 (20)	1 (6)	
<b>Diabetes Education: 'Yes' n (%)</b>			
	15 (94)	12 (67)	0.288
<b>Educator n (%)</b>			
GP	3 (20)	2 (17)	-
Diabetes Educator	1 (6.5)	0	
Dietitian	1 (6.5)	0	
More than 1 HP	10 (67)	9 (75)	
Other	0	1 (8)	

Abbreviations: HP= health professional, \*missing data n=1 for both cohorts

### 9.4.2 Focus Groups

A total of ten focus groups were held; five for older adults with diabetes in the community and five for those residing in RAC, with new topics only generated in the first three focus groups for both cohorts, and no new topics generated thereafter in focus groups four and five (Figure 20). After conducting five groups for each cohort it was decided that further focus groups were unlikely to generate any new information and that data saturation had been reached.

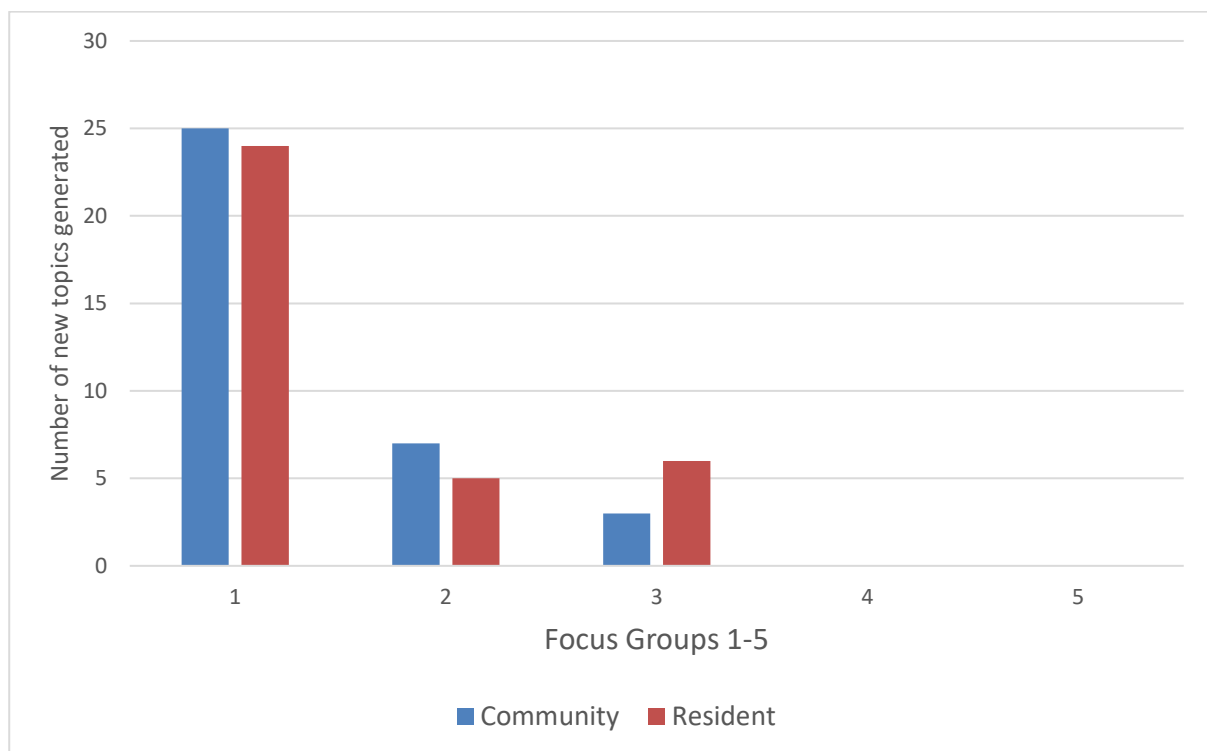


Figure 20 - Number of new topics discussed at each session for community and residential aged care based older adults with diabetes

### 9.4.3 Thematic analysis

On analysis of the data, three key themes were generated across both cohorts: Choice, Restriction and the Food service system, which include 14 sub-topics of discussion. Table 23, outlines the key themes, topics and exemplar quotes identified in this study. Each of the three key themes is now discussed within the context of the research question.



Table 23 - Key themes (n=3), topics (n=13) and exemplar quotes from community based older adults with diabetes as compared to older adults with diabetes in residential aged care

Key Theme	Topics	Exemplar quote from Older adults with diabetes residing in their own home	Exemplar quote from Older adults with diabetes residing in RAC
Choice	Autonomy	<i>"..I think you've missed one factor though and that is the need for us to be in control.....and institutional care, the first thing that's sacrificed is self-control. We need to be part of the decision-making process and nursing homes are ill-equipped for that."</i> (reflecting on experience with a loved one)	<i>"I have done it for years so they can do it now"</i>
	Usual food habits	(recounting an acute care admission and likening to expectations for RAC) <i>"They bring around the food menus and since I'm one of those people I believe in juggling the meals, I decided that the dessert looked so beautiful that I would drop out the carbohydrate in the main course so I could keep my carbohydrate load under control by switching from potatoes and rice to the sweet. However, when the meal arrived, the potatoes and rice weren't there but nor was the sweet because the dietitian on duty had said "Oh no, he's diabetic, he's not allowed a sweet. As a result I had a hypo!"</i> (recounting an admission to hospital)	<i>"I'm not really a sweet-tooth. I've had diabetes for 41 years and I got used to going without sweet things."</i>  <i>"My sweet is always going to my neighbour...Yeah I've eaten it before but it's too sweet. I cannot eat it"</i>
	Food preferences	<i>"..I think everything in moderation. I don't have anything exceptionally....a lot of anything in particular"</i>	<i>"..It takes a while tasting of things to decide the things you like. Some things sound quite exciting, but when you eat it,</i>

<b>Dietary restriction</b>	Source of knowledge (informing dietary management of diabetes)	<i>"... then I took it upon myself to come to Diabetes SA and then I've recently been to NDSS. That's the first time I've been with a nurse educator and then, subsequently, a dietician who I've elected to see within three months rather than the six mostly because of the weight issue"</i>	<i>it's not good at all, so you choose the other one next time"</i>  <i>"Don't eat oranges..... A friend of mine and he said to me "It's full of sugar" so I asked the doctor and he said "Yes, that's right" so I don't eat oranges"</i>
	Diet and diabetes	<i>"I mean one of the things I discovered was that it's much easier to control diabetes if you are in control of what you take in and, as I say, I juggle that almost sort of daily basis."</i>	<i>"I've had diabetes now for 23 years...I think I've always tried to follow the rules. I've just cut sugar out of everything and gradually got more used to it..."</i>
	Health beliefs (impacting dietary management of diabetes)	<i>"Diabetes is like having a passenger alongside you in the car...but it's OK to put the passenger in the back seat sometimes and be a bit 'naughty', but you've got to remember to put the passenger back in the front seat and look after oneself..."</i>	<i>" that was just what you did, once you were diagnosed with diabetes you know, you were told this is what you do and you did it"</i>
<b>Food Service System</b>	Flexibility	<i>"The last thing I need is to fill out a menu two days in advance. ...have no idea whether I want to eat that..."</i>  <i>"What I'm looking for is the ability at the last moment to swap out carbohydrate for vegetable fats. I need last minute choice. You don't need to be treated like a naughty child"</i>	<i>"Speaking of meal times, I found it the most difficult to adjust to because at home if I as working I would be breakfast 7 am, lunch 1pm and evening dinner about 7. To squeeze them all into a shorter space – somehow I got over and am now enjoying it".</i>

Food quality	<i>“I would hate to think that my final years were from living out of enormous tinned vegetable cans like as if I was in some sort of hostel living or something....”</i>	<i>“ If you think about it though, the hotels and things, they cook for hundreds and they put good food out, not that I’m saying we go to that standard, but it can be done”</i>
Food texture	<i>“Crisp crunchy vegetables always. Green veg not grey veg.”</i>	<i>“..The meat is old and tough. It’s been put through the shredder so many times”</i>
Familiar foods	<i>“If you go back to my parents’ age group ...they like vegetables but not salads. We’re eating differently now to what we did”</i>	<i>&lt;on being asked if the diet is similar to usual food choices&gt; “no, completely different....yes different cultural foods”</i>
Food miles	<i>“As long as they’re Australian grapes and not brought in from America – oranges that come from the Riverland and not from the United States. And I’m finicky about it’s got to be Australian.... I only want what I know”. And that’s how I’m becoming.”</i>	<i>“ locally grown and fresh – but it’s all frozen and sometimes it’s still frozen – it tastes frozen”  “..And all the goodness is out of the vegetables – I don’t know how many times vegetables have been around the world...”</i>
Social dining	<i>“That’s probably another aspect – if food isn’t going to be social, then it needs to be interesting and tasty because very frequently as you get more decrepit, you’re left in your room and you’re only eating on your own or somebody might come and feed you. So it’s no longer a social interaction when you eat...”</i>	<i>“No disrespect or anything, but it would be nice to have a conversation” (on being sat with residents with dementia)  “I think it’s a lot to do with her hearing and they don’t work, but it’s not for me to say – I just pay my money and stay here”</i>
Meal experience	<i>“That’s probably another aspect – if food isn’t going to be social, then it needs to be interesting and tasty because very frequently as you get more decrepit, you’re left in your room and you’re only eating on your own or somebody might come and feed you. So it’s no longer a social interaction when you eat...”</i>	<i>“..Everything is always hurried. ‘Have you finished yet?’...it’s not a good place to be at when you are eating to be hurried along like that especially those poor souls that have to be shunted in...it’s quicker than they can chew!”</i>

On discussing the experience of older adults on moving into RAC, there was a general sentiment of complacency and reluctance to express dissatisfaction,

*Resident FG 1- "but it's not for me to say – I just pay my money and stay here".*

Overall there was a preference to handover their diabetes management to staff and that they "could look after it now" (FG3) which may be in part due to the hierarchal relationships with health professionals that older adults over >85yrs appeared to be more familiar with,

*Resident FG3 - "...You were told this is what you do and you did it".*

Conversely, baby boomers were more likely to want to pursue healthy ageing and self-management of their diabetes for as long as possible. Their experiences of diabetes education were of a collaborative relationship with health professionals, "I've been with a nurse educator and then, subsequently, a dietitian who I've elected to see within three months rather than the six" (Community FG2). The oldest old perceived their diabetes management should be rigid and they were either compliant or non-compliant.

#### **9.4.4 Theme 1: Choice**

Baby boomers were less likely to approach their diabetes management in this traditional way and speculated that they would continue to want choice and a collaborative approach to their health in ageing,

*Community FG2 - "...I think you've missed one factor though and that is the need for us to be in control.....and institutional care, the first thing that's sacrificed is self-control. We need to be part of the decision-making process and nursing homes are ill-equipped for that."*

The theme of dietary management of diabetes was relevant to both baby boomers and older adults in RAC. Although distinct differences were observed for where knowledge was obtained, the underlying theme of restriction was evident in comments from both groups which impacted, to some extent, on food choices.

#### **9.4.5 Theme 2: Dietary Restriction**

The baby boomer cohort were more likely to be educated to a higher level than their older counterparts and as discerned in the focus groups, were more likely to pursue diabetes education outside of the minimum information provided at time of diagnosis

*Community FG1 - "... then I took it upon myself to come to Diabetes SA and then I've recently been to NDSS".*

Those baby boomers that had invested in diabetes education with a self-management focus were more likely to apply this knowledge through a flexible approach to their food choices utilising a carbohydrate counting approach. Comments often related to inclusion of 'occasional' discretionary foods and swapping main meal carbohydrate serves to better afford inclusion of a dessert. While their education offered confidence in optimal glycaemic control regardless of dietary choices, it was evident that restriction of sugar was still a primary concern and was the food that created most discussion in relation to the perceived negative impact it had on their diabetes management.

In older adults residing in RAC the perception of dietary management of diabetes through sugar restriction was much more overt, and residents recalled not having received diabetes education since their diagnosis. The majority of older adults participating in the focus groups could remember being told to avoid sugar by their general practitioners, and this was further reinforced by comments from family and friends who had also received diabetes education,

*Resident FG5 – "Don't eat oranges..... A friend of mine and he said to me "It's full of sugar" so I asked the doctor and he said "Yes, that's right" so I don't eat oranges".*

As a result those people that had followed advice all their lives continued to avoid sweet foods in RAC, *"My sweet is always going to my neighbour... Yeah I've eaten it before but it's too sweet. I cannot eat it" (Resident FG1).* Overall, food choices were impacted by understanding of diet and diabetes, influenced by prior education and friends and family. While older adults were more ambivalent about the importance of good diabetes management as they aged and often trusted the facility to take care of it, baby boomers were anxious about their future. Baby boomers were concerned about the lack of familiarity and flexibility they might experience in RAC as well as having their control and choice over basic diabetes management taken away

*Community FG2 - "I mean one of the things I discovered was that it's much easier to control diabetes if you are in control of what you take in and, as I say, juggle that almost on a daily basis."*

#### **9.4.6 Theme 3: Food service System**

The anxiety felt by baby boomers extended to the general food service and quality of food offered in RAC. This was the only theme where both cohorts were in consensus on their food 'wants'.

Most of the baby boomers attending the focus groups had experiences of a relative in RAC, or had received institutionalised diets in an acute care setting. Their experience was that meals were bland and that foods were overcooked or unrecognisable on the plate, which resulted in a perception that low quality ingredients were being used. Similarly, older adults in RAC felt that the meals they were receiving were of a low quality, again with a resignation that they expected no different, (referring to hotel food services)

*Resident FG3 - "...They cook for hundreds and they put good food out, not that I'm saying we go to that standard, but it can be done".*

The origin of quality ingredients was also a recurring theme in 2 out of 5 resident focus groups, and in all five of the community focus groups: with both cohorts referring to locally sourced foods but in particular the use of fresh produce which would ideally be cooked and served on the same day,

*Resident FG1 - "...And all the goodness is out of the vegetables – I don't know how many times vegetables have been around the world..."*

Older adults wanted foods which were familiar and still had plate appeal and texture, *Resident FG2 - "Crisp crunchy vegetables always. Green veg not grey veg".*

Older adults in RAC did not always find the meal choices similar to those they ate when in independent living, and there was again a general acceptance of needing to adjust to their new environment,

*Resident FG2 - "...It takes a while tasting of things to decide the things you like. Some things sound quite exciting, but when you eat it, it's not good at all, so you choose the other one next time".*

Finally, the topic of social dining and meal timing was raised by both groups. Baby boomers agreed that the meal experience was as important as food quality to promote quality of life in RAC

*Community FG3 - "...if food isn't going to be social, then it needs to be interesting and tasty because very frequently as you get more decrepit... So it's no longer a social interaction when you eat..."*

Older adults already in RAC were not as forthcoming in critiquing the service aspects of their care, but did share the sentiment that meals were often not social,

*Resident FG3 - "No disrespect or anything, but it would be nice to have a conversation".*

In addition, residents from this group often felt hurried by staff at mealtimes,

*Resident FG3 - "...Everything is always hurried. 'Have you finished yet?'...it's not a good place to be at when you are eating to be hurried along like that especially those poor souls that have to be shunted in...it's quicker than they can chew!"*

with many of them also lamenting about the volume of food they observed being wasted.

## 9.5 Discussion

Diabetes is an independent risk factor for entry into RAC and is associated with more falls and hospital admissions than for older adults without diabetes <sup>(74)</sup>. Dietary management of diabetes is a cornerstone of optimal management and prevention of chronic complications but also acute symptoms, many of which can have immediate impact on the quality of life of older adults. Dietary guidelines for diabetes management have become more flexible and an individualised approach to diet with regard to functional status, diabetes and comorbidity outcomes is desirable <sup>(30)</sup>.

From the literature, older adults in RAC were more often observed as passive in their transition from independent living <sup>(191)</sup>. In a review of the literature by Lee et al (2002) <sup>(191)</sup> passively accepting circumstances was recognised as a coping strategy of older adults adapting to the constraints of RAC living. Study participants were noted to 'conform' to the daily schedule and to 'obey' new home rules and norms <sup>(191)</sup>. With this same attitude of conforming, findings from this study indicated acceptance of handing over diabetes management to care staff and trust that diets were made suitable by staff for their health management. Residents that were concerned about the suitability of meal items (particularly desserts and sweet condiments) chose not to raise concerns with staff but instead did not order these items from the menu or passed them "to [their] neighbour". Not only does this support theories that older adults currently in RAC are less likely to complain but it is clear that health beliefs around sugar restriction and diabetes still persist long after initial diabetes education has been provided.

Conversely the new wave of 'baby boomers' are thought to likely challenge current aged care

practices, with their increased interest in remaining healthy and a more proactive approach to managing their own health in ageing <sup>(201)</sup>. Baby boomer participants in focus groups were more likely to be self-managing their diabetes, and had invested in education which offered them more dietary flexibility. The theme of dietary restriction particularly around foods known to be high in sugar, was still evident in their health beliefs but was generally balanced with a 'moderate' approach of occasional inclusion rather than all or nothing, "*... it's OK to put the passenger in the back seat sometimes and be a bit 'naughty', but you've got to remember to put the passenger back in the front seat and look after oneself*". Baby boomers ultimately want the freedom to choose how they manage their diabetes and subsequently to have food choice, which is consistent with literature examining quality dining in RAC <sup>(180, 202)</sup>. Baby boomers were anxious that they would want to retain autonomy for as long as possible, but most felt that it was unlikely RAC could support this in the current model, "*institutions are very blunt instruments for dealing with masses of people*" (Community focus group 2).

Despite a difference in expectations for diabetes management in RAC, all participants from this study were in consensus on the issue of food quality and preferred the idea of an individualised food service, also commenting on the importance of an enjoyable meal experience. The issue of food quality was of more importance than the overall approach to diabetes management with diet, as older adults felt if there was adequate choice of familiar foods they would be able to self-regulate a diet that was consistent with their diabetes management. This is congruent with findings in the literature regarding dining preferences in RAC <sup>(180, 202)</sup>. In a more recent study by Evans et al (2005), the authors note that health professionals are often profoundly concerned about regulatory measures of health and service provision in their approach to menu planning, but rarely recognise that for residents 'good nutrition' is defined within the context of their life experiences <sup>(180)</sup>. When older adults are adjusting to a new social world such as in RAC, the sharing of familiar or traditional foods with others can help with coping and affirmation of their identity <sup>(180)</sup>.

In this study, while the older adults residing in an RAC were less likely to offer explicit criticism of the service they received, there was dissatisfaction with the food being offered particularly in relation to familiarity, palatability and texture. Those residents receiving their meals from a cook-chill food service system, where meals were distributed from a central kitchen and reheated in the dining rooms were most dissatisfied, and expressed issue with temperature, flavour and textures



more so than residents in a cook-fresh system. Older adults from both food service systems reported finding many of the meals unfamiliar, particularly residents of ethnicity other than Australian, who found that attempts to recreate their cuisine were unacceptable to them.

Finally, the mealtime and dining experience was discussed by both focus group cohorts. Older adults often referred to the amount of wasted food they observed, attributable to the large serves of unpalatable food and rushed mealtimes, “*everything is always hurried. ‘Have you finished yet?’*”. These sentiments endorse what was observed in Chapter eight, with mealtimes often being brief in duration and with multiple courses presented at the same time. Although for some residents participating in the focus groups, comments suggested that they preferred not to linger at mealtimes due to being seated with other residents who were not able to engage in a social mealtime experience.

In summary, serving food that is appetising is essential to a quality dining experience and the most important indicator of satisfaction in an institutional setting<sup>(202, 203)</sup>. Food quality has been defined as the flavour, freshness, temperature and presentation of a meal<sup>(202)</sup> and in this study of older adults and baby boomers, both cohorts desired these food qualities. While the familiarity and experience of food is of importance in how older adults cope with transitioning to RAC<sup>(180)</sup>, the ability to consume enough food and nutrients, and from foods they perceive to support and maintain good health outcomes is also a key concern, particularly for baby boomers in this study. When food is unpalatable, in this case for a range of reasons, the risk of poor oral intake and subsequently malnutrition is high. It may therefore be prudent to consider that regardless of whether the menu is deemed restrictive or liberalised in its design: if food choice is not familiar, not appetizing and does not appear to be fresh and flavoursome then the quality is questioned and individual food intake may be limited for all residents<sup>(204)</sup>.

### **9.5.1 Implications for practice**

The challenge of offering an individualised approach in an institutional setting poses many challenges to the food service system as it currently stands. Changes to the system at all levels would be necessary to create a service that could be reactive to resident preferences on short order, which has further implications for the food service system and the level of expertise required in the kitchen. With more food choice, food quality or frequently changing menus comes budgetary issues, assessment of nutritional adequacy and need for frequent review for allergy

management. In addition the service would require access to a wide range of foods and a food ordering system that can accommodate short notice changes. A comment was raised by one RAC resident in this study that hotels can do it; so is this a model that can be adapted for future aged care services?

## **9.6 Summary**

In summary, while diabetes management appears to be of continuing importance to baby boomers, our future RAC clients, it is important to consider that for them this means dietary choice with a sense of autonomy. Older adults wish to be free from a system or staff making choices for them. Equally for all older adults participating in the focus groups, regardless of place of residence, food quality was important and was defined by familiar food choices that are cooked freshly and from ingredients that resemble the look and texture of the original food i.e. not chopped and diced or cooked until they have lost colour and texture. In the current food systems in RAC it is evident that accommodating older adult preferences would require changes at all levels of the system and is likely to impact on current budgetary constraints and staff skillset. While focus groups in this study were limited to older adults with diabetes, key concerns for diet and nutrition management in ageing seem to be sourcing a diet that sits well with health beliefs and that is deemed to be of good quality: which could be pertinent to a much wider ageing population and would merit further research going forward.

Chapter ten is the final chapter within this body of work and aims to summarise key findings from each of the studies, while addressing the over-arching mixed methods research question that led to the sequence of studies presented in this thesis.

## CHAPTER TEN – SUMMARY AND CONCLUSION

*“it’s the quality of life that you look for....going out, going there, can’t do that, can’t drive...at the end it’s the food that’s everything because by the time we’ve lost the car, we’ve lost everything...and food is the highlight’ RAC Resident Focus Group 3*

### 10.0 Overview

Ageing and obesity are catalysts for diabetes diagnosis, particularly type 2 diabetes in later life and with the rapidly growing population aged 85yrs and over, it is realistic to acknowledge that significant costs and time will be attributable to diabetes management in RAC <sup>(2, 205)</sup>. The costs to health services are already considerable, and literature has highlighted that older adults with diabetes frequently encounter more acute care admissions from RAC than their peers without diabetes. Studies suggest that this cohort also have lower outcomes for quality of life and frequently are managed for depression, particularly where their care is sub-optimal and diabetes outcomes and complications are not managed adequately <sup>(206)</sup>. Combined with this, is the changing landscape of provision of aged care services and the needs of the modern aged care client <sup>(194)</sup>. Consumer directed care is focused on choice and autonomy in ageing which is somewhat at conflict with delivery of a traditional institutional food service system, where a hierarchal care model still seems to be in place. This is particularly relevant for older adults with significant comorbidity, such as those with diabetes and for whom self-management has been a staple part of their health professional education. Currently there is little research exploring current practices in the management of older adults with diabetes and their demographics, but in particular there are no studies exploring how prospective RAC clients may want to be managed with respect to their chronic health condition. Therefore this research aimed to explore the policies underpinning practices in dietary management of diabetes in older adults and to explore the experience, wants and needs related to diabetes and nutrition, in both current and prospective users of aged care services.

### 10.1 Mixed methods research question

What discordance exists between policy and practice for dietary management of older adults with diabetes in RAC: and how is this impacting the current and prospective resident?

## 10.2 Summary of this research

The primary impetus for this research was related to key observations by the researcher during prior clinical practice as an APD. These observations were that:

1. Despite significant changes proposed to the dietary management of older adults with diabetes, currently there are no mandated guidelines for the management of diabetes and diet in RAC
2. General and aged care specific best practice guidelines for older adults were inconsistent in their key messages regarding nutritional management of diabetes
3. Confusion and anxiety regarding appropriate dietary management of diabetes in RAC was being raised by patients and their families to the candidate as a practising dietitian, particularly in cases where lifelong dietary practices were not being reflected in food offerings to older adults with diabetes in RAC.

Therefore this body of work focused on addressing some of the questions arising from these observations and with reference to the full food service system. This research aimed to examine what documents are available to guide practice, which documents are known about in RAC, and how are they being implemented with respect to diet composition in RAC facilities. In addition this research wanted to examine how a lack of non-mandated guidelines have impacted diet and diabetes management with regard to meal output and from staff and resident perspectives and level of satisfaction. Furthermore, this research aimed to introduce dialogue around how our current practices might be received by the emerging ageing population, the baby boomers. By doing so this research aimed to contribute new knowledge on which to base practice guidelines and further research.

A pragmatic mixed method approach within a food systems model framework was employed to explore the research objectives itemised in chapter one. Six individual studies were designed to best answer the research questions arising from the objectives and to address the core components of a food systems model. The first three studies were designed using quantitative methods to determine what policy exists and on what level of evidence have recommendations been made. A subsequent study then examined what recommendations were being implemented in aged care facilities around Australia. These studies therefore addressed the controlling

information guiding the observed RAC food system model, with respect to diabetes management, menu design and food offerings. A final quantitative study exploring the characteristics of aged care clients with diabetes was conducted to better understand the current aged care population, where previous published literature was at least 13 years old <sup>(32, 76, 117)</sup> at the time of writing this thesis. Characteristics of a good food systems model are that they are open to feedback and changing environments and this research aimed to also acknowledge these aspects of the model <sup>(39)</sup>. It is important that the full model was considered in this research with each component being related to another and changes at any point having the potential to impact the full system.

Using an explanatory sequential approach, the quantitative studies were followed by three qualitative studies designed to provide explanation and context to the quantitative findings. In addition these findings also addressed the feedback component of the food service model. Qualitative studies aimed to receive feedback from the key stakeholders that are integral to the food service system. These included the staff that receive instruction regarding the menu and dietary provision to residents. In addition, evaluation of the current service was sought from existing residents with diabetes in RAC, as well as perceived wants and needs from prospective residents: therefore the final study also targeted baby boomers with diabetes residing in their own homes. Each study was designed to contribute new knowledge to an area where there is currently little literature to draw on.

On comparing findings of each study within the context of this framework, it was evident that three themes were prominent and interconnected in how they impact the food service system as a whole. These themes that emerged are: the food service system, health beliefs and autonomy and choice.

### **10.2.1 The food service system**

The controlling component of a food service system is the governing principles of the intended service and the documents that might underpin these <sup>(39, 207)</sup>. In this thesis it has been highlighted that considerable change has been proposed in the dietary management of diabetes in RAC. Initially these recommendations were presented in the form of position statements from special interest bodies such as the ADA <sup>(87, 208)</sup> and the AND <sup>(68)</sup> and subsequently in RAC specific best practice guidelines <sup>(34, 146)</sup>. In response to concerns for the prevalence of malnutrition in older adults in RAC a liberalised diet which removed caloric restriction and 'no added sugar' prescription

for older adults with diabetes was recommended. It was believed that the impact of re-introducing sugar and more 'normal' foods into the diet would increase food choices and therefore oral intake for this cohort thereby reducing their risk of malnutrition and improving quality of life <sup>(68, 139)</sup>.

The evidence on which recommendations were based was examined in chapter three and found that no data had been presented that could reliably state that a change in dietary prescription would either change nutritional status or improve quality of life <sup>(116)</sup>. In addition the impact of a diet which permitted more ad libitum consumption of sugar sweetened beverages and foods has not been well evaluated with respect to diabetes management outcomes. Despite this, even current ADA position statements <sup>(101, 123, 124)</sup> on the management of diabetes in older adults in RAC have continued to cite the same advice of removing therapeutic diets based on 'no added sugar' and caloric restriction, derived predominantly from two studies <sup>(32, 51)</sup>. These statements have in turn been cited in broad diabetes management guidelines reviewed in chapter four, with varied interpretation.

The general diabetes management guidelines developed by physicians often referred to the liberalised diet as an approach for older adults that are frail or losing weight <sup>(17)</sup> but that typical dietary management should be based on general population healthy eating recommendations and individualised as necessary <sup>(2, 17)</sup>. Of the eight general practice guidelines reviewed, some also cite the known benefits of a Mediterranean style diet or DASH diet on comorbidities such as CVD <sup>(17, 123)</sup>. Similarly UK documents for older adults in RAC, have approached dietary management of diabetes with a 'healthy eating' approach and individualisation if weight loss is observed <sup>(140, 152)</sup>. Conversely the best known and cited Australian aged care specific best practice document <sup>(34)</sup> have interpreted the liberalised diet for older adults through a malnutrition lens. As such the guideline includes a menu checklist which encourages frequent inclusion of calorie dense meals and mid-meals for all residents, as a more prophylactic approach to malnutrition.

This discordance between documents and the lack of mandatory reference to any of them by AACQA <sup>(36)</sup> has meant that implementation of a liberalised diet within RAC in Australia has been inconsistent. Chapter five highlighted that more than half of all RAC survey respondents around Australia were still offering a therapeutic diet for older adults with diabetes which was characterised by restriction of foods with added sugar, some core food groups, in particular fruit; and in some instances were also restricting full fat dairy foods. While there is a lack of robust

evidence to suggest that a therapeutic diet will adversely impact oral intake: there is significant research to support individualised diets based on familiar foods and adequate inclusion of core food groups to support optimal oral intake and nutritional status in institutionalised individuals<sup>(84, 157)</sup>. Institutional menus that include any form of dietary restriction, but particularly of core food groups are concerning, and findings from this research highlight the extent to which nutrition messages are potentially being misinterpreted in this setting.

The menu is frequently deemed the blueprint of the food service, and sets the tone and requirements for the rest of the system. It is the position of the ADA that a menu with a 'one size fits all' approach is not desirable in a heterogeneous population such as RAC<sup>(84)</sup> and particularly those with additional comorbidities such as diabetes. However, the implementation of individualisation of diets in this context is problematic<sup>(156)</sup>, particularly where ACFI funding does not extend to expert nutrition input<sup>(10)</sup>. A recent review on optimising nutrition in RAC by Argawal et al (2016) proposes that current menu accreditation standards may be inadvertently impacting malnutrition through their inability to address adequate food choice and nutrient needs for older adults<sup>(157)</sup>. A widely endorsed aged care guideline which can cater for multiple groups needs appears warranted. However, an unexpected finding through conducting this research was that dietary restriction could also manifest at a number of other occasions within the food service system and importantly were events that have potential to impact all older adults in RAC, not just those with diabetes. This was typically as a result of long-held beliefs regarding best practice management of diabetes.

### **10.2.2 Health beliefs**

Health beliefs was the second theme to arise as a result of this research and were found to impact food offerings at a service level, as well as in the food choices being made by residents. The collaboration of chefs, cooks, other foodservice staff and dietitians play a significant role in optimising food intake and avoiding the risk of developing malnutrition in older adults in aged care facilities<sup>(209, 210)</sup>. A number of studies support the importance of collaborative work and a multidisciplinary approach to achieve holistic nutritional management of aged care residents<sup>(209-211)</sup>. However several studies have highlighted that staff in RAC have poor or outdated knowledge of diabetes management<sup>(212-214)</sup>. In particular nursing and food service staff who were surveyed in two studies were found to believe that sugar restriction and use of 'diabetic' products were still

essential for the dietary management of diabetes <sup>(212, 214)</sup>.

In the study described in chapter seven, examining staff health beliefs and practices regarding diabetes management, it was evident that in some instances RAC staff were influencing meal orders and meal serve sizes. This influence was typically based on their own understanding of diabetes management which frequently was not informed by professional education. Staff health beliefs meant that residents were likely to be restricted in what they could order, for example sweet desserts; or in having sugar on foods or in drinks; or staff were amending standard serve sizes of items they deemed unsuitable. The staff that assist with mealtimes, ordering or serving could be considered to be nutrition gatekeepers. Staff that can impact the food service system can include cooks, chefs, food service assistants and nursing or care staff; who might all play a role in collecting food orders, the preparation of meals and menu design and the delivering and assisting with meals in the dining room or at the bedside. In a small study by Deakin and Littley (2001) authors found that an educational program to care home staff improved knowledge and associated quality of care for residents with diabetes for up to a year after the intervention <sup>(215)</sup>. Implications for delivering training would be identifying key personnel and lobbying for protected time in the work day to ensure good attendance. As highlighted in chapter seven, currently professional development is poorly supported by RAC at an organisational level and this is mirrored internationally <sup>(216)</sup>. Where staff are receiving clinical and service updates via a paper memorandum, there is risk of ineffective communication and poor uptake of new knowledge.

While it is clear that health beliefs are impacting food offerings from staff, this theme also extended to residents' own food choice. Food preferences or choice is complex and impacted by a number of social and environmental factors, many of which are informed over a period of years from childhood into adulthood <sup>(180, 217)</sup>. It is suggested that beliefs about nutritional quality and health effects of a food may be important to some individuals in their food choices and that this can be heavily influenced by peers, marketing and media, cultural or religious factors <sup>(218)</sup>. In the focus groups with residents in chapter nine, it was evident that long held personal health beliefs and education on diabetes management were still strongly adhered to by some older adults and residents in RAC. It was these individuals that stated they would not order sweet desserts, or if given them would '*pass them over*' to their neighbour. Long held food preferences were influencing food choices and what was eaten and therefore dietary restriction was being imposed by some older adults themselves.



Residents in RAC further elaborated on issues influencing their food choice. On this theme, residents noted that foods they were offered were frequently not 'familiar', either cooked in a different style to their own cooking, or not resembling and tasting like foods they enjoyed eating e.g. diced or overcooked vegetables and dry, tough meat. Conclusions drawn in this chapter (chapter nine) were that the current resident population in RAC could learn to be accepting of their food choices but food quality was of particular importance to them. This was very much similar to a study which examined resident preferences for meals in RAC, and found that older adults were reluctant to raise issues with their meals but highlighted the importance of taste and quality of their meals <sup>(219)</sup>. In the research conducted as part of this thesis, when discussing diet in reference to their diabetes management, residents suggested they could usually find something on the menu that they felt would be suitable for them, but when it was served it may become unacceptable due to the quality, taste or texture. This is of particular concern, but also of interest to nutrition professionals working with the aged care population, in strategizing how to improve oral intake. These findings do raise questions as to whether simply offering more choices, such as in a liberalised diet, actually improves oral intake, if the quality or type of the meals is not acceptable to the recipients.

One strategy proposed to manage food quality is the use of standardised recipes that have been trialled and tested, and which are then rigorously implemented <sup>(41)</sup>. Currently the use of standardised recipes are also not mandatory in RAC food services, and where not already in place, require time and money spent on developing and training in delivering them. Improvements in food quality will have implications for food spend or budget and staff skill or equipment and processes and therefore will require ongoing consideration by policy makers in this setting. However the study by Milte et al (2018) also highlighted that in order to benefit from food service improvements, residents were prepared to pay more for their care when their expectations were likely to be met <sup>(219)</sup>.

This is particularly important in considering the changing nature of RAC in response to the proposed needs and wants of baby boomers <sup>(5, 16)</sup>. Health beliefs are also likely to be significant in the perceived satisfaction of baby boomers with their experience of RAC meals and special diet provision. Chapter nine contrasted experiences of current RAC residents with expectations of baby boomers with diabetes. Focus group participants had similar views regarding diet quality. Individuals from both cohorts desired a diet of familiar foods that were made from quality

ingredients and cooked freshly, and raised their concerns that this might not be possible within current system constraints. But in particular, baby boomers expressed that they would hope that they could maintain similar food patterns, not be limited to restrictive meal timings and have control over their food choices and diabetes management for as long as was feasible as they aged. Whereas RAC residents' health beliefs were still very much aligned with historical recommendations for avoidance of sugar, baby boomers predominantly adopted a 'moderate' dietary approach: whereby all foods could be eaten 'moderation', with many making reference to some form of carbohydrate counting.

Almost 100% of the baby boomer focus group participants had received education from a health professional following diabetes diagnosis, with many also pursuing their own information and education on an ongoing basis. Baby boomers rated their diet as an important strategy in diabetes management even into older age and RAC if needed, with very few participants envisaging handing over their care to nursing staff unless medically necessary. Frequently, dietary flexibility was discussed with respect to including '*dessert*' or '*dropping out carbohydrate*' to achieve moderation, a diet that was enjoyable but which also maintained desirable glycaemia and diabetes outcomes. Health beliefs were strongly entrenched in self-management: with one participant summing up that if a quality menu with adequate choice was provided, appropriate dietary choices could be made thereby making a separate therapeutic menu redundant. However there was significant anxiety that on entering an institution, whether it be acute care or RAC, dietary choice and flexibility would be limited and that autonomy in food selection would not be supported.

### **10.2.3 Autonomy and Choice**

Under the food system and health belief themes, it has been made evident that indeed dietary choice and autonomy may be challenging within the current food system model. The menu design is limited in menu selection for all residents and which may be further restricted for an individual with diabetes in some institutions. Food timings are often inflexible and meals are generally planned to be accommodating of when skilled staff are in the kitchen: with hot holding of evening main meals which were cooked at lunchtime, being a common practice. Food choices may be further limited by the residents themselves due to the unfamiliar food offerings and/or by staff and their own beliefs on appropriate diets for health management. This gives rise to significant

opportunity for low satisfaction with meals and the mealtime experience which for many in RAC is the 'highlight of the day' <sup>(157)</sup>.

Focus groups with residents and baby boomers in chapter nine highlighted that these were indeed issues for participants, but whereas residents were more compliant of this level of service, baby boomers perceived themselves to be less accepting. They suggested that having to order their meals, "*days in advance*" would not be desirable and want to have "*last minute choice*" (Chapter 9). Although not common in RAC, a room service style food service model has been trialled in acute care institutions <sup>(220-222)</sup>. This model requires a significant system change but has demonstrated good satisfaction outcomes with clients and reduced food wastage for the food service department operating on a constrained budget <sup>(222)</sup>. This style of model is gaining interest from private RAC providers, particularly now older adults have control of their aged care spending since the aged care reform.

Current aged care reform is focused on a client centred care and social model whereas historically it has been a provider-driven medical model. The proposed social model aims to prioritise decision making abilities of their clients and thereby respecting their values and preferences and is similar to changes occurring in aged care services internationally <sup>(196, 223)</sup>. However difficulties in implementing this philosophy include the inevitable conflicts between clients' wishes and staff perceptions of clients' best interests <sup>(223)</sup>. This is likely to be particularly evident over the ageing continuum and where older adults become progressively more dependent. However an approach has been proposed whereby decision making be divided into 'life decisions' and 'tacit decisions': where important life decisions are carefully weighed with informed opinion and advocates where necessary and tacit decisions are those that could be based on habitual ways of acting and interacting <sup>(224)</sup>. Tacit decisions could extend to food choice and meal timing, information on which is often collected at the time of admission to RAC. Although there is a risk that without regular review, this could interfere with autonomy and choice.

An Australian study examining how CDC changes were being received as a newly implemented initiative here, found that challenges were being experienced at many levels but frequently coming back to the changes in structure and authority over decision making that this model required <sup>(196)</sup>. Although the study was examining impact of home service packages, it is expected that the philosophy of CDC will flow through into RAC. It is likely that the challenges of

implementation will be amplified in this setting where the traditional service values are equally embedded in staff training and goals for service providers. Chapter eight was the first study to really highlight how the themes of control, autonomy and choice could impact the wider RAC population, not just those with diabetes.

Chapter eight describes the observation study conducted to explore any different management of residents with diabetes as compared to their peers without diabetes. While no significant differences were observed, it could be seen that staff had collected information on resident food preferences. However, it was observed that this information was used to order meal items without consultation or limited what was offered at the mealtime. An example of this was at breakfast, where all RAC sites offered several cereal choices as per the menu, but none of the options were presented to the resident: instead known preferences were pre-plated and served to the resident on entering the dining room. Although this could be seen as making a tacit decision based on usual practices, all of the residents in the dining rooms observed were determined as cognitively intact and with the exception of several individuals, most required no mealtime assistance. In fact it was observed that where residents were given milk or water jugs and condiments this created a more social dining experience. It is therefore with caution that we do not assume that older adults in RAC cannot have some autonomy in decision making. Food in particular is noted in the literature as an important locus of control for older adults, and can assist in older adults' transition to RAC when this control can be executed <sup>(180)</sup>.

The analysis of the observation field notes in chapter eight, did not determine any differences in practices for residents with and without diabetes. However, it did offer significant insight into the mealtime experience for older adults in RAC and the inflexible nature of an institutionalised approach to food services. In particular there was a lack of responsivity at mealtimes. Examples included the assigned seating which was rigidly adhered to even when residents were eating alone with their backs to windows and other residents, or when individuals' were clearly unhappy with their allocated table and companions. A further observation was the lack of interaction between staff and residents during meal service: and in particular the lack of acknowledgement when meals were cleared untouched, and no alternative meal was offered. This is particularly concerning when so many efforts are being made at the system level to manage malnutrition, but are then not being managed at a service level.

#### 10.2.4 Discordance in policy and practice

In summary, this thesis has identified that there is discordance in the relationship between policy and practice that has the potential to impact all stages of the food service model, and subsequent negative outcomes could extend to all older adults in RAC, not just those with diabetes. With respect to the food service framework on which the sequence of studies was modelled

**Controlling factors:** The lack of mandatory guidelines for the management of diabetes in older adults in RAC, and the differing opinion of how to manage older adults with diabetes has created inconsistency in practice. The menus currently being implemented appear to more often resemble a restrictive diet, not only in discretionary serves, for this population and worryingly are endorsed by dietitians. This highlights the lack of understanding of how to manage older adults with diabetes, and perhaps the lack of acknowledgement or support to negotiate diet and health goals with older adults themselves. As a result, residents with diabetes in RAC are being offered a limited menu or potentially a menu that has been designed for a frail elderly population: which in view of findings in this thesis, may not be appropriate for all older adults with diabetes in RAC. The inflexible nature of the current system and 'order ahead' menu with limited (predetermined) food choices is also at conflict with the system that baby boomers hope to receive; which would ideally be flexible in meal timings and able to accommodate short orders.

**Resources:** The lack of mandatory guidelines means that the design of the food service system and subsequently the 'resources' are determined by the menu and constraints of existing resources within the RAC, such as kitchen design, budget, staffing and their skillset. Frequently provision of restrictive therapeutic diets to older adults with diabetes were based on the philosophy that this had always been what was offered (**Memory**). This was further impacted through the lack of opportunities to upskill or update staff on changing philosophy and challenge health beliefs with regard to care of older adults with diabetes. As a result staff were noted to be 'doctoring' meal orders and food offerings to these residents.

**Potential change indicators:** On observation of what was being offered to residents and evaluation of how this was being received, it was determined that a lack of choice was not only limited for older adults with diabetes. Resident meal preferences were frequently collected at time of admission and meals were thereon in being pre-plated without consultation with the resident. Alternative options at mealtimes were not offered, even when meals were cleared un-

touched, and this was rarely acknowledged by staff members. This again highlights that the importance of adequate nutrition is not understood by RAC staff, or possibly that staff are not empowered to manage these situations appropriately within the constraints of the food service system.

**Feedback:** Evaluation of resident experience of mealtimes was that they were hurried and that the meal quality was poor. Several participants chose not to order foods that were unfamiliar based on long standing advice for diabetes management from health professionals (such as sweet desserts), and most residents made food choices based on familiar foods where possible. Baby boomers when participating in focus groups, were anxious that the food will be of poor quality (tinned and over-cooked) and valued a service that could offer them fresh meals, cooked to order and with enough meal choices that residents can determine their own 'suitable' diet for diabetes management, rather than it being dictated to them.

**Environmental context:** In summarising the impact of this discordance in policy and how the lack of clear direction is impacting practice: it was clear that larger issues concerning the changing paradigm of aged care is also at tension with current service provision to all older adults in RAC. Client centred care changes the relationship between provider, staff and resident and aims to provide more control to the resident. In the current medical model there has been observed a clear hierarchy, with medical and care staff often having most impact on decisions around food, not the resident. This is at direct conflict with expectations of baby boomers and their perceived needs as they age. In addition, while the lack of mandatory guidelines is clearly impacting consistency in practice, it may be that development of future guidance needs to be reflective of changes to the culture of aged care services. While diabetes management appears to still be of importance to baby boomers, as a result of health empowerment education and chronic disease self-management, younger older adults are more likely to want to engage in self-care and health decision making. This is likely to extend to their diet and day to day flexing of carbohydrate type, load and medication management. Future menu and aged care guidelines should consider this to ensure that they are not in conflict with the principles of CDC, whilst also acknowledging the heterogeneity of the population and management of respecting identity with declining independence. In addition, development of separate guidelines for older adults living in the community seem warranted. More services at home are intended to be developed to delay entry into RAC and currently there is limited guidance for the delivery of specialised meal services in this

setting.

### **10.3 Strengths and limitations**

This sequence of studies was conducted within the limits of a PhD candidature and so the opportunity to extend data collection to achieve statistical significance or data saturation was not always viable. In addition the research was all conducted (with the exception of the web survey) in South Australia. Therefore the generalisability of findings should be interpreted with caution. Although such limitations are not uncommon in the published literature and studies of the same nature as those discussed. The studies were framed using a modified framework that was proposed by Lengyel et al <sup>(39)</sup> however the authors suggest that further testing of this model may be warranted, for the usability of proposed components. It may be that this research could be discussed within a different framework, and that better representation of groups such as food service staff and RAC management may offer a broader stakeholder view on key themes presented in this thesis.

With respect to individual studies, the response rate to the national web survey in chapter five was lower than was desirable. However the sample was large enough to draw conclusions and was representative of different regional areas in most states as well as different size institutions. It is noted in the literature that web survey responses are on average 11% lower than paper based surveys <sup>(225)</sup> and therefore future research may consider replicating using a postal survey method. However, the response rate achieved in this study was on par with expected rates between 10-25%.

The retrospective audit presented new data to contribute to the body of literature examining characteristics of older adults with diabetes. While the study design limits the conclusions that can be drawn regarding factors influencing malnutrition risk, sample size calculations suggest that sufficient data was collected to discuss findings in relation to the general older adult population with diabetes. A longitudinal study design examining trends in oral intake, weight and health outcomes may be useful to better understand the nutrition and ageing continuum as baby boomers arrive into RAC.

Focus groups with staff in RAC were limited to only 14 participants, with a poor representation from food service staff overall. Although qualitative methods do not define ideal participant

numbers for this type of study, as a result of low interest and attendance, it was not possible to achieve data saturation. Ideally future research would have a larger recruitment pool and would consider strategies that might facilitate better attendance rates. Final focus groups with residents and baby boomers were well attended and data saturation was reached, although to enhance validity of these findings, replicating the focus groups in other states and territories and with a different facilitator would be ideal.

## **10.4 Conclusions**

There is a lack of evidence to support that a liberalised diet for diabetes management is effective in reducing malnutrition risk while improving quality of life outcomes for the resident. In addition, recommendations for a liberalised diet are not well defined or communicated in best practice management guidelines, with many of the documents developed for more general diabetes management not offering specific nutrition advice for older adults in RAC. Conversely aged care specific guidelines designed by nutrition professionals for RAC food services have been interpreted through a malnutrition lens and present an energy dense diet which may be at conflict with typical management of glycaemia in diabetes management. Subsequently, RAC across Australia are inconsistent in what is being provided to residents with diabetes and more often are restricting food choices offered to this cohort, which has implications for dietary adequacy. Ironically despite attempting to liberalise diets, staff facilitating meal ordering and mealtimes may be limiting food offerings to residents with diabetes but also engaging in practices that have the potential to negatively impact oral intake of all residents. As well as this, residents themselves may have long held health beliefs that are influencing their food choices, with many choosing not to order food items at conflict with long held dietary habits related to health advice. Looking to the future and how to address these issues, opinion was sought from baby boomers with diabetes. Food choice is known to be influenced by many factors but predominantly the environment in which the individual has been brought up: which for baby boomers is significantly different to our current aged care population, many of which will have been born during the depression and food scarcity. Data from this research suggests that baby boomers are more likely to be overweight on entry to RAC and would prefer to retain autonomy in diabetes self-management for as long as possible. This cohort are well versed in health self-management and propose that ample food choice, good food quality, autonomy and flexibility is of most importance to them as they age.



## 10.5 Implications for practice

The lack of widely accepted nutrition guidelines for the management of older adults in RAC, with or without diabetes is promoting variability in practice throughout the whole food service system: and in view of the findings presented by the candidate, should be considered a contributory factor to residents' poor oral intake. The menu design, whether liberalised or therapeutic, appears to be only one factor influencing food offerings, with many other parts of the food service system also impacted by the lack of descriptive and mandatory controlling information. Currently there is a lack of support from government agencies to establish a mandatory nutrition guideline <sup>(37)</sup> despite RAC stakeholder support. However, in view of the poor outcomes (with respect to malnutrition and quality of life) for residents without any clear guidance as it stands currently, it would seem prudent that a way of bridging this gap is found in the interim.

With respect to diabetes management in RAC, it is clear that the evidence on which a change in dietary recommendations has been based, in nutrition specific guidelines is not robust <sup>(116)</sup>. The advice to offer all older adults a liberalised diet is also in conflict with general management <sup>(17, 123)</sup> and global guidelines of older adults with diabetes <sup>(2)</sup>. Suboptimal management of diabetes outcomes has known medical consequences that will impact the quality of life and risk of mortality for residents. Therefore, where a resident is not completely functionally dependent or considered to be at 'end of life' or for palliative treatment, modified usual management of diabetes should ideally be continued <sup>(2)</sup>.

While a new best practice guideline that incorporate findings from this research would be desirable, it is also important to consider the necessary training and the endorsement such a document would need to ensure messages are widely disseminated. As seen in this research, staff training is not seen as a priority for RAC or food service staff at present, and even within the dietetic profession there was inconsistency in practice. Overseas the use of a celebrity chef endorsed guideline has proved somewhat successful <sup>(226)</sup>, in addition to country specific professional associations promoting new evidence based documents for widespread use. In addition Diabetes UK have called for a requirement in aged care home accreditation, that their best practice guidelines be cited in facility documentation and to benchmark services <sup>(216)</sup>. Here in Australia accreditation quality standards have just undergone review with the intention of strengthening recommendations for nutrition as one of the improvement outcomes. This

increases opportunities for a new nutrition guideline to be developed and evaluated, with the intent of becoming an evidence based document that could be presented in subsequent reviews of AACQA quality standards due to be rolled out between July 2018 -2019. To some extent the Maggie Beer Foundation and Lantern project are already working towards promoting best practices in the residential aged care domain in Australia, and could be key players in the training and endorsement of any new best practice evidence based guidelines that were to be developed.

Overall the research presented in this thesis has contributed new information on older adults with diabetes both in RAC and those residing in their own homes. The research has also observed the current food service model in RAC and identified that a widely endorsed menu guideline may help with benchmarking and promoting consistency in practice. In addition this research has also somewhat substantiated concerns of baby boomers, that the current food service system is inflexible and not designed to deliver their perceived wants and needs. Therefore there is clearly a need for further research examining how revised menu guidelines might be developed to support a system that is designed to accommodate client centred care and promote autonomy and self-management in food choice.

## **10.6 Future research**

The lack of mandatory or widely endorsed set of guidelines for aged care has implications for practice and is contributing to inconsistencies between RAC facilities but also in our own discipline of dietetics. In an era where we as a discipline are trained to empower and teach self-management in health and nutrition, it is important that we promote similar strategies in our practice documents. There is emerging evidence to support a new model of food service using a room service model <sup>(220)</sup>, which can be cost effective and well received by clients and which sits well with social model of consumer directed care. Future research exploring the use of this model in RAC for all residents in addition to those with diabetes, and evaluating nutrition adequacy of diets and diabetes outcomes could be useful before revisiting menu guidelines for this setting.

Finally, in view of the significant shift of aged care services to manage older adults in their own home, which was outside of the scope of this thesis, it may also be prudent to consider how future guidelines might be developed for community agencies providing aged care food services to people in their own homes.

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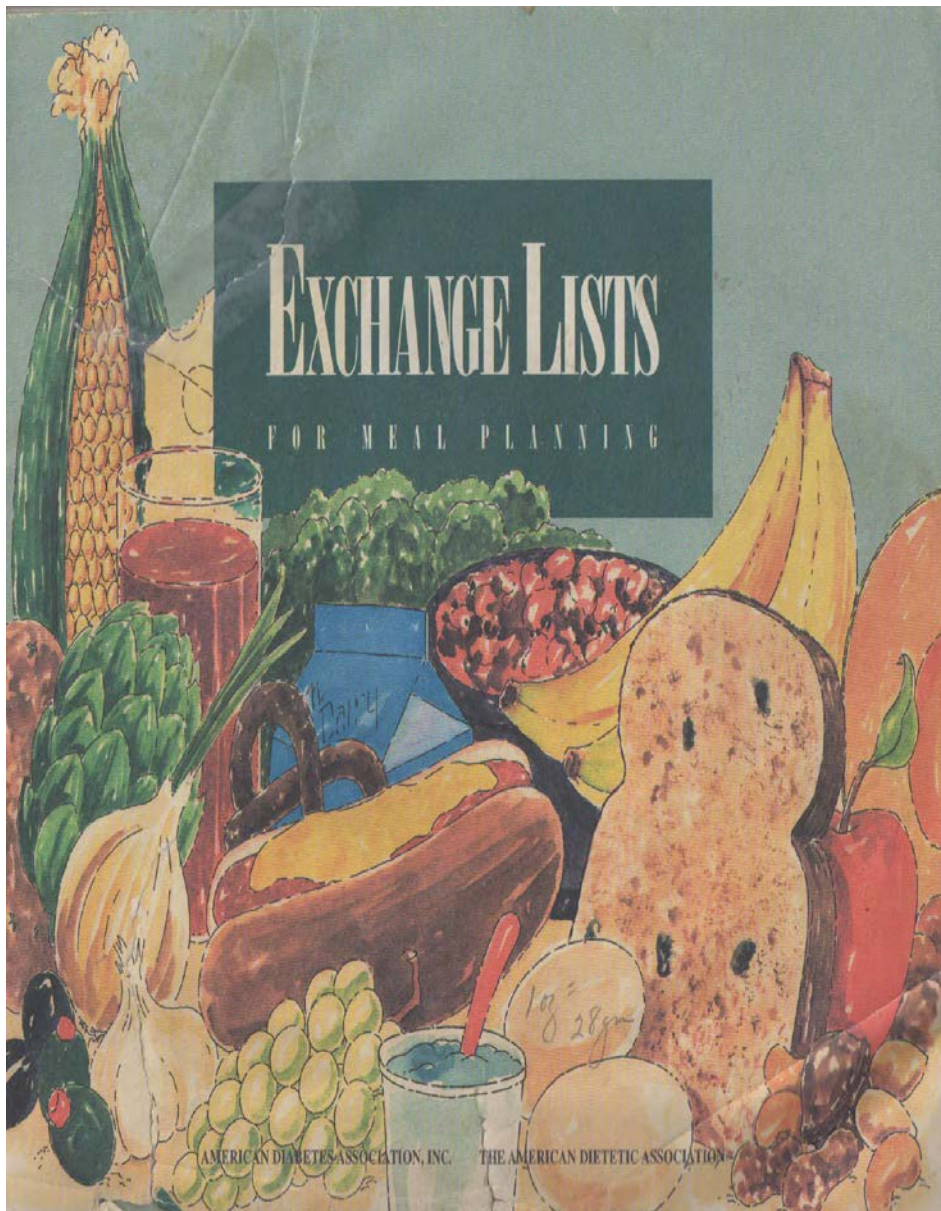
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**APPENDIX 1 – CARBOHYDRATE COUNTING (1970s – 1980s)**





1 oz = 28 gm

**One starch exchange equals**

15 grams carbohydrate,  
3 grams protein,  
0-1 grams fat, and  
80 calories.

**Bread**

Bagel .....	1/2 (1 oz)
Bread, reduced-calorie .....	2 slices (1 1/2 oz)
Bread, white, whole-wheat, pumpernickel, rye .....	1 slice (1 oz)
Bread sticks, crisp, 4 in. long x 1/2 in. ....	2 (2/3 oz)
English muffin .....	1/2
Hot dog or hamburger bun .....	1/2 (1 oz)
Pita, 6 in. across .....	1/2
Roll, plain, small. ....	1 (1 oz)
Raisin bread, unfrosted. ....	1 slice (1 oz)
Tortilla, corn, 6 in. across .....	1
Tortilla, flour, 7-8 in. across .....	1
Waffle, 4 1/2 in. square, reduced-fat. ....	1

**Cereals And Grains**

Bran cereals. ....	1/2 cup
Bulgur .....	1/2 cup
Cereals. ....	1/2 cup
Cereals, unsweetened, ready-to-eat. ....	3/4 cup
Cornmeal (dry). ....	3 Tbsp
Couscous .....	1/3 cup
Flour (dry) .....	3 Tbsp
Granola, low-fat .....	1/4 cup
Grape-Nuts .....	1/4 cup
Grits .....	1/2 cup
Kasha .....	1/2 cup
Millet. ....	1/4 cup
Muesli .....	1/4 cup
*Oats .....	1/2 cup
*Pasta .....	1/2 cup
Puffed cereal. ....	1 1/2 cups
Rice milk. ....	1/2 cup
Rice, white or brown. ....	1/3 cup
Shredded Wheat .....	1/2 cup
Sugar-frosted cereal .....	1/2 cup
Wheat germ .....	3 Tbsp

PASTA  
178 gm cooked =  
56g dry =  
42gm Carbo

**APPENDIX 2 - CARBOHYDRATE EXCHANGES CURRENTLY USED IN LEVEL  
1 AND 2 CARBOHYDRATE COUNTING EDUCATION**

## Carbohydrate counting and diabetes

Foods that contain carbohydrate are an important source of fuel for your body. These foods include bread, pasta, rice, grains and cereals, legumes, fruits, starchy vegetables, milk and yoghurt. Your body breaks down carbohydrates into glucose in the bloodstream. Glucose is used by the body's cells for energy.

It's important to know how much carbohydrate is in the food you eat to understand the effects on your blood glucose levels. This can help you with managing your diabetes. Carbohydrate counting is a way of estimating the amount of carbohydrate in different foods.



### Why is the amount of carbohydrate important?

All carbohydrates are converted to glucose within about two hours of eating, directly affecting your blood glucose levels. Spreading carbohydrate foods evenly across the day can help maintain energy levels and keep your blood glucose levels within your target range.

- » Eating too much carbohydrate at one time can result in high blood glucose levels after meals.
- » Eating too little carbohydrate can result in low energy levels. If you use insulin or certain types of blood glucose lowering medications, eating too little carbohydrate or skipping a meal can make your blood glucose level drop too low and cause hypoglycaemia (a hypo).

### How to count carbohydrates

The amount of carbohydrate in food can be counted using a number of different methods. Counting carbohydrate exchanges is one way of estimating the amount of carbohydrate in food.

A carbohydrate exchange is an amount of food that contains approximately 15 grams of carbohydrate. Exchanges don't refer to the weight of a food – for example, a slice of bread can weigh 40 grams but only contain 15 grams of carbohydrate (one exchange).

**Helpline 1300 136 588**

**ndss.com.au**

The National Diabetes Services Scheme is an initiative of the Australian Government administered with the assistance of Diabetes Australia.

Different carbohydrate foods can be 'exchanged' for one another so that you consume a similar amount of carbohydrate. Some examples of one carbohydrate exchange include:

- » 1 slice of bread
- » 1 medium apple
- » ½ cup of cooked rice
- » 1 cup of milk.

Sometimes carbohydrates may be counted in grams instead of exchanges. This method is most commonly used by people who manage their diabetes with an insulin pump or multiple daily injections (MDI).

Another way to count the amount of carbohydrate in food is by counting carbohydrate portions. A carbohydrate portion (CP) is the amount of food that contains 10 grams of carbohydrate. This method is most commonly used by people who follow the Dose Adjustment For Normal Eating (DAFNE) program.

For more information about the different methods of carbohydrate counting and what is best suited to you, talk to a dietitian.

### How much carbohydrate should you eat?

The amount of carbohydrate you need each day depends on your age, gender, weight and activity levels. Talk to a dietitian about your individual needs.

The following table gives a general guide to the amount of carbohydrate the average Australian man and woman may need at each main meal (breakfast, lunch and dinner).

	Grams of carbohydrate at main meals	Carbohydrate exchanges
Women	30 – 45	2 – 3
Men	45 – 60	3 – 4

### What about snacks?

If you use insulin or certain types of blood glucose lowering medications, you may need to eat a carbohydrate-based snack in between meals and before going to bed to prevent a hypo.

If you need snacks, aim for 1–2 carbohydrate exchanges per snack (that is, 15–30 grams of carbohydrate).

### Sample meal plan

This meal plan is an example of what carbohydrate counting looks like across a day.

Each main meal provides three (3) carbohydrate exchanges and each snack provides one (1) carbohydrate exchange. The carbohydrate foods are in bold.

Meal	Food	Carbohydrate exchanges
Breakfast	½ cup <b>natural muesli</b> with 250ml <b>low-fat milk</b> and ½ cup berries	3
Snack	1 small banana	1
Lunch	2 slices <b>wholegrain bread</b> with ½ cup <b>baked beans</b>	3
Snack	1 <b>apple</b> and 30g unsalted raw nuts	1
Evening meal	100g grilled chicken/ beef/tofu stir-fried with ginger and garlic, 2 cups mixed vegetables, and served with 1 cup cooked <b>basmati rice</b>	3
Snack	100g <b>low-fat fruit yoghurt</b>	1



### Carbohydrate exchanges

A carbohydrate exchange list provides information about the serving size of food that is equal to one exchange (15 grams of carbohydrate). Examples are shown in this table. Note that these are a general guide and the amount of carbohydrate in food can vary between brands.

Carbohydrate food	One exchange (15 grams of carbohydrate)
Bread and bread products	1 regular slice of bread/fruit bread 1 small roti/chapati 1 crumpet – round shape ½ bread roll or ½ English muffin ½ wrap or ½ pita 'pocket' bread / ¼ large pita bread ¼ bagel
Breakfast cereals	⅓ cup raw rolled oats ¼ cup natural muesli containing dried fruit 1½ wheat biscuit type cereal ½ cup flake type cereal with dried fruit
Rice/pasta/grains/flour	½ cup cooked pasta ½ cup cooked noodles (rice/egg/soba) ⅓ cup cooked rice/quinoa/couscous ½ cup cooked barley/bulgur (cracked wheat) 2 tablespoons flour/corn flour/raw polenta
Biscuits/crackers	9 rice crackers 2 thick/3 thin rice or corn cakes 2-3 plain crispbreads, medium size 6 plain crispbreads, small squares/rounds 2 plain sweet biscuits/fruit slice biscuit
Starchy vegetables	1 small potato (70g) or ½ cup mashed potato ½ cup sweet potato (100g) ½ cup sweet corn kernels or 1 medium cob (170g)
Legumes	½ cup cooked/canned bean mix including chickpeas, kidney beans, cannellini beans, baked beans ¾ cup cooked/canned lentils
Fruit	1 medium apple/pear/orange/peach 1 small banana (½ medium) 1 small mango (½ medium) 3 small apricots 3 small or 2 medium mandarins 2 kiwifruits/plums/small nectarines 1½ cups diced rockmelon/watermelon/honeydew 1 cup berries/cherries/canned fruit (drained) ½ cup grapes 1 tablespoon sultanas 4 dried dates/prunes
Milk and milk products	250ml low-fat milk/soy ½ cup evaporated skim milk 200g diet yoghurt/natural yoghurt 100g low-fat fruit yoghurt ½ cup low-fat custard

### Reading food labels

You can also use the nutrition information panel on a food label to work out the number of carbohydrate exchanges in the food you eat. The nutrition information panel shows the total grams of carbohydrate per serve.

Nutrition information			
Servings per package: 5			
Serving size: 140g			
		Quantity per serving	Quantity per 100g
Energy		285KJ	203KJ
Protein		0.5g	0.3g
fat	- Total	0.1g	0.1g
	- Saturated	0.1g	0.1g
Carbohydrate	- Total	15.5g	11g
	- Sugars	12.2g	8.7g
Sodium		7mg	5mg

For example if you ate one serve of this food, this would provide 15.5 grams of carbohydrate which is equal to one carbohydrate exchange.

This table can help you to calculate the number of exchanges when reading a nutrition information panel.

Total grams of carbohydrate per serve	Carbohydrate exchanges
7 – 11	½
12 – 18	1
19 – 26	1½
27 – 33	2
34 – 41	2½
42 – 48	3



### More information

An accredited practising dietitian (APD) can provide more information and advice on carbohydrate counting and whether you need to have snacks between meals.

Recommended carbohydrate counting books include:

- » *The Traffic Light Guide* carbohydrate counter [www.thetrafficlightguide.com.au](http://www.thetrafficlightguide.com.au)
- » Allan Borushek's *Calorie, fat & carbohydrate counter* [www.calorieking.com.au](http://www.calorieking.com.au)

Recommended apps include:

- » The Traffic Light Guide to Food app [www.trafficlightguide.com.au/app](http://www.trafficlightguide.com.au/app)
- » CalorieKing Australia Food Search app



### The NDSS and you

The NDSS provides a range of services to help you manage your diabetes. These include our Infoline and website for advice on diabetes management, NDSS products and a range of support programs to help you learn more about managing your diabetes.

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This factsheet is intended as a guide only. It should not replace individual medical advice and if you have any concerns about your health or further questions, you should contact your health professional.

**APPENDIX 3 – ADVANCED CARBOHYDRATE COUNTING (EXTRACT FROM LILLY™ PATIENT EDUCATION HAND OUT)**

## How Many Carbs Do You Need to Eat?

Your registered dietitian can help decide how many carbs you need. The amount depends on your age, weight, activity, and diabetes medications, if used. You can learn how “counting carbs” at each meal (and snacks, if needed) can help keep your blood sugar within your target range.

1 carb choice = 15 grams (g) of carbs

	Most <b>WOMEN</b> Need	Most <b>MEN</b> Need
Each Meal	3 to 4 carb choices = 45 to 60 g of carbs	4 to 5 carb choices = 60 to 75 g of carbs
Snacks (if needed)	1 carb choice = 15 g of carbs	1 to 2 carb choices = 15 to 30 g of carbs

Talk to your registered dietitian or healthcare provider to determine how many carbs are right for you.

Carbs are an important part of a healthy meal plan. Watching portion sizes and getting most of your carbs from fruits, vegetables, whole grains, low-fat milk, and yogurt is important.

### Sample meal with 4 carb choices:

- 1 slice of whole wheat bread (1 carb choice)
- ½ cup mashed potatoes (1 carb choice)
- ½ cup canned peaches (1 carb choice)
- 1 cup skim milk (1 carb choice)

Add these foods to complete the meal, which will mainly provide nutrients other than carbs:

- 3 ounces of chicken (0 carb choices)
- 1 green salad (0 carb choices)
- 1 to 2 tablespoons of dressing (0 carb choices)

If you're taking insulin with your meals, you can talk to your healthcare provider or registered dietitian about the options you have to match your dose with the amount of food you're eating.

For a referral to a registered dietitian or more information on meal planning, contact the Academy of Nutrition and Dietetics at [www.eatright.org](http://www.eatright.org).

## Learn to Identify Carbohydrates— Read Food Labels

Nutrition Facts	
Serving Size 8 Crackers (28g)	
Amount per serving	
Calories 120	Fat Calories 30
% Daily Value	
Total Fat 3.5g	5%
Saturated Fat 1g	5%
Trans Fat 0g	
Polyunsaturated Fat 1.5g	
Cholesterol 0mg	0%
Sodium 140mg	6%
Total Carbohydrate 22g	7%
Dietary Fiber 1g	3%
Sugars 7g	
Protein 2g	
Vitamin A 0%	Vitamin C 0%
Calcium 10%	Iron 4%

Check the serving size: 8 crackers. Is that how much you plan to eat? The number—28 g—is the weight of the crackers, not the amount of carbs in the serving.

Count total carbs.

You do not need to count sugars separately because they are already counted as part of the total carbs.

### To calculate carb choices:

Divide the total grams of carbs by 15 (1 carb choice = 15 grams of carbs).

Example:

1. Total carbs = 22 g.
2. 22 divided by 15 = 1.47 (round to 1.5).
3. Therefore, 8 crackers would be equal to 1½ carb choices.

Some foods do not come with labels. Look for nutrition information on websites of food manufacturers and restaurants. Many restaurants also have nutrition information available that you can review before you order.

If a food contains more than 5 g of fiber, you can subtract half the grams of fiber from the grams of total carbs and use that new number as the food's total carb count. The same rule applies for sugar alcohols. If a food contains more than 5 g of sugar alcohols, subtract half the grams of sugar alcohols from the grams of total carbs and use that new number as the food's total carb count.



**APPENDIX 4 - SYSTEMATIC LITERATURE REVIEW SEARCH STRATEGY**

## Created search strategy: 28/01/2014 and repeated 17/01/2018

### PubMed /Medline

Do not include humans limit (no English used)

(nursing home\* OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR aged care facilit\* OR care home\* OR "residential care" OR institutionalized elder\* OR institutionalised elder\* OR institutionalized older adult\* OR institutionalised older adult\* OR skilled nursing facilit\* OR (resident\* AND dementia) AND (diabet\* OR NIDDM OR IDDM OR T1DM OR T2DM) AND (diet\* OR "nutrition therapy" OR nutritional therap\* OR menu\* OR food service\*))

### Informit (Health subset only) – Advanced search

Do one line at a time and then combine using Search Manager

1. nursing home\* OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR aged care facilit\* OR care home\* OR "residential care" OR institutionalized elder\* OR institutionalised elder\* OR institutionalized older adult\* OR institutionalised older adult\* OR skilled nursing facilit\* OR (resident\* AND dementia))
2. diabet\* OR NIDDM OR IDDM OR DM
3. diet\* OR "nutrition therapy" OR nutritional therap\* OR menu\* OR food service\*
4. Weight\* OR BMI OR Adiposity
5. #1 AND #2 AND #3 AND #4 = 36 results

### Scopus (use in Web of Science/Knowledge)

Before search, deselect physical sciences and life sciences options. Could also limit to document type "article or review"

1. "nursing home\*" OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR "aged care facilit\*" OR "care home\*" OR "residential care"
2. "institutionalized elder\*" OR "institutionalised elder\*" OR "institutionalized older adult\*" OR "institutionalised older adult\*" OR "skilled nursing facilit\*" OR (resident\* AND dementia))
3. #1 OR #2
4. diabet\* OR NIDDM OR IDDM OR T1DM OR T2DM
5. diet\* OR "nutrition therapy" OR "nutritional therap\*" OR menu\* OR "food service"
6. glycaemi\* OR glycemi\* OR hypo\* OR hyper\* OR hemoglobin\* OR haemoglobin\* OR hba1c OR glucose
7. #3 AND #4 AND #5 AND #6
8. Weight\* OR BMI OR Adiposity
9. #7 AND #8 = 284 results

## Cochrane

(nursing home\* OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR aged care facilit\* OR care home\* OR "residential care" OR institutionalized elder\* OR institutionalised elder\* OR institutionalized older adult\* OR institutionalised older adult\* OR skilled nursing facilit\* OR (resident\* AND dementia)) AND (diabet\* OR NIDDM OR IDDM OR T1DM OR T2DM) AND (diet\* OR "nutrition therapy" OR nutritional therap\* OR menu\* OR food service\*)

## CINAHL

(nursing home\* OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR aged care facilit\* OR care home\* OR "residential care" OR institutionalized elder\* OR institutionalised elder\* OR institutionalized older adult\* OR institutionalised older adult\* OR skilled nursing facilit\* OR (resident\* AND dementia)) AND (diabet\* OR NIDDM OR IDDM OR T1DM OR T2DM) AND (diet\* OR "nutrition therapy" OR nutritional therap\* OR menu\* OR food service\*)

## Web of Science

1. "nursing home\*" OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR "aged care facilit\*" OR "care home\*" OR "residential care" OR "institutionalized elder\*" OR "institutionalised elder\*" OR "institutionalized older adult\*" OR "institutionalised older adult\*" OR "skilled nursing facilit\*" OR (resident\* AND dementia)
2. #1 OR #2
3. diabet\* OR NIDDM OR IDDM OR T1DM OR T2DM
4. diet\* OR "nutrition therapy" OR "nutritional therap\*" OR menu\* OR "food service"
5. glycaemi\* OR glycemi\* OR hypo\* OR hyper\* OR hemoglobin\* OR haemoglobin\* OR hba1c OR glucose
6. #3 AND #4 AND #5 AND #6 = 39 results

## Ageline

1. "nursing home\*" OR "long term care" OR "longterm care" OR "residential aged care" OR LTCF OR "aged care facilit\*" OR "care home\*" OR "residential care"
2. "institutionalized elder\*" OR "institutionalised elder\*" OR "institutionalized older adult\*" OR "institutionalised older adult\*" OR "skilled nursing facilit\*" OR (resident\* AND dementia)
3. #1 OR #2
4. diabet\* OR NIDDM OR IDDM OR T1DM OR T2DM
5. diet\* OR "nutrition therapy" OR "nutritional therap\*" OR menu\* OR "food service"
6. glycaemi\* OR glycemi\* OR hypo\* OR hyper\* OR hemoglobin\* OR haemoglobin\* OR hba1c OR glucose
7. #3 AND #4 AND #5 AND #6 = 35 results

**APPENDIX 5 - WEB SURVEY QUESTIONS FOR RAC FOOD SERVICE MANAGERS (ADMINISTERED ONLINE VIA SURVEY MONKEY)**

**\*1. Which state is your facility based in?**

- NSW
- ACT
- QLD
- VIC
- SA
- TAS
- WA
- NT

**\*2. Would you classify your facility as:**

- Metropolitan
- Outer metropolitan
- Rural
- Remote

**\*3. How many beds in your facility do you cater for? *(Please insert number)***

**\*4. What type of facility is this? *(Please tick all that apply)***

- Ageing in place
- Dementia specific
- Low care
- High and low care
- High care
- Other (please specify)

**\*5. Who manages the food service department at your organisation on a daily basis?**

- Food service manager with catering qualifications/background
- Food service manager without catering qualifications/background

- Nutrition and Dietetics Manager
- Nursing/ Resident Services Manager
- Dietitian/ Nutritionist
- Chef
- Cook
- Nursing/ Other care staff
- Other (please specify)

**\*6. How many qualified chefs are employed at your facility? (Please give response as number of Full-Time Equivalent positions)**

**\*7. How many staff involved in food preparation and not trained as chefs are employed at your facility? (Please give response as number of Full-Time Equivalent positions)**

**\*8. What Dietitian (in Full Time Equivalent, FTE) does the food service department currently have access to?**

- 1.0 FTE
- 0.6-0.9 FTE
- <0.5 FTE
- Employed Dietitian visits on request only
- Contract Dietitian visits on request only
- None
- Other (please specify)

**9. What is the main food service system used at your facility currently?**

- Cook-Fresh
- Cook-Chill (Food is cooked then held chilled until required and re-heated)
- Cook-Freeze (Food is cooked then held frozen until required and re-heated)

- Meals are brought in from an external company/kitchen
- Mixture of Cook-Fresh and Cook-Chill/Freeze
- Other (please specify)

**\*10. How are meals distributed to the residents at mealtimes?**

- Centrally plated and delivered via trolley directly to residents
- Centrally plated and delivered via heated/refrigerated trolley to residents
- Bulk food delivered in heated/refrigerated trolleys
- Meals are cooked in small kitchens accessible to residents within the facility
- Other (please specify)

**\*11. Which meal serve size are offered at main times? (Please tick all that are applicable)**

- Small
- Regular
- Large
- Residents can request a serve size when collecting their meal

**\*12. How far in advance do residents select their meals?**

- Food choices made at each mealtime - no prior ordering
- Morning of meal service
- Evening prior to meal service
- More than 24 hours before meals to be served
- No choice provided
- Other (please specify)

**13. Where are main meals service to the residents at your facility?**

- At the bedside
- In a communal dining room
- Residents have a choice of bedside or communal dining room

**\*14. Does your facility have any policies around 'protected mealtimes' whereby staff are discouraged from interrupting eating with other duties e.g. cleaning, medical procedures?**

- Yes
- No
- Not known

**\*15. Are residents able to access and use a kitchen area (e.g. with tea, coffee making facilities, fridge)?**

- Yes, also utilized for serving meals
- Yes, separate to the kitchen utilized for serving meals
- No

**\*16. Do residents ever help with preparation for meals?**

- Yes
- No

**\*17. What sort of preparation for meals do residents help with? *(Please tick all that apply)***

- Setting tables
- Peeling or cutting ingredients
- Heating up meals
- Serving meals
- Cleaning away plates after meal
- Doing the dishes

**\*18. Does the facility have set times for meals?**

- Yes, all meals are served at a set time
- Yes, lunch and dinner are served at set times, breakfast is offered with flexible timing



- Meals are offered at a range of times (e.g. flexible dining)
- Other (please specify)

**\*19. Are family members able to eat meals within the facility?**

- Yes, occurs regularly
- Yes, with prior notification to the kitchen
- Yes, on special occasions
- No

**\*20. Are family members able to access tea or coffee or snacks from the facility when they visit their relative?**

- Yes
- No

**\*21. Does your facility currently use a policy, guidelines or set of standards to guide menu planning or food provision to the residents?**

- No
- Not known
- Yes (please specify if known)

**\*22. Who currently reviews the menu for nutritional adequacy and patient safety e.g. allergies?**

- Facility food service dietitian
- Facility clinical dietitian
- Casual dietitian primarily hired for patient consults
- Casual dietitian hired specifically for menu review
- Other (please specify)

**\*23. Is feedback from residents sort on the menu? (Tick all that apply)**

- No
- Yes, written feedback forms are available in the dining room
- Yes, a written questionnaire is sent out
- Yes, a formal group with resident representative provides feedback
- Other (please specify)

**\*24. What is your current menu cycle length?**

- 1 week
- 2 weeks
- 3 weeks
- 4 weeks
- No specified menu cycle
- Other (please specify)

**\*25. Is there a seasonal menu offered at your facility (i.e. change from summer to winter menu)**

- Yes
- No

**\*26. When is the main meal time as reflected by the menu (i.e. the meal with the most hot meal options)?**

- Lunchtime
- Evening meal
- Both meals have same number of hot and cold options

**\*27. How many hot choices are available at the main mealtime?**

- 1

- 2
- 3
- More than 3
- No choice available

**\*28. How many cold options are available at the main mealtime?**

- 1
- 2
- 3
- More than 3
- No choice available

**\*29. Are residents offered any of the following? (Please tick all that apply)**

- Morning tea
- Afternoon tea
- Before bed snack
- Light refreshments available all day
- Other (please specify)

**\*30. How easy is it to accommodate a special request from resident based on a like or dislike?**

- Very easily, occurs regularly
- Can occur with more than 12-24 hours' notice
- Residents don't have the opportunity to amend menu items

**\*31. Residential care facilities use lots of different techniques to try and encourage residents to eat and to enjoy the experience. Is your residential care facility using any of the following techniques to improve meals and dining for residents? (Tick as many as apply)**

- High contrast plates (e.g. highly coloured plates)
- Use of table cloths for dining room
- Staff joining residents for meals
- Redesigning menu to include resident favourite meals
- Using moulds to re-form texture modified foods
- Mealtime music
- Commercial oral nutritional supplements (e.g. Sustagen)
- Involving family in feeding residents
- Use of volunteers during mealtimes
- Snacks available on demand
- Finger foods available on the menu
- Adaptive equipment (e.g. large handled cutlery or plate guards)
- Other (please specify)

**\*32. Does your facility cater for any the following other special diets? (Please tick all that apply)**

- Nourishing or high energy high protein diet
- Low fat
- Allergy meals such as lactose free, gluten free
- Low potassium/sodium
- Other (please specify)

**\*33. Does your facility cater for any of the following texture modified diets?**

- Texture modified - soft diet
- Texture modified - Minced and moist diet
- Texture modified Smooth Puree diet
- None catered for

**34. How many choices of main meal do residents on a texture modified soft diet have at lunch usually?**

- Not offered

- No choice
- 2 choices
- 3 choices
- More than 3 choices

**35. How many choices of main meal do residents on a texture modified soft diet have at dinner usually?**

- Not offered
- No choice
- 2 choices
- 3 choices
- More than 3 choices

**36. How many choices of main meal do residents on a texture modified - minced and moist diet have at lunch usually?**

- Not offered
- No choice
- 2 choices
- 3 choices
- More than 3 choices

**37. How many choices of main meal do residents on a texture modified - minced and moist diet have at dinner usually?**

- Not offered
- No choice
- 2 choices
- 3 choices
- More than 3 choices

**38. How many choices of main meal do residents on a texture modified - smooth pureed diet have at lunch usually?**

- Not offered

- No choice
- 2 choices
- 3 choices
- More than 3 choices

**39. How many choices of main meal do residents on a texture modified - smooth puree diet have at dinner usually?**

- Not offered
- No choice
- 2 choices
- 3 choices
- More than 3 choices

**40. Does your facility offer a special Diabetic menu or diet? \*conditional release question**

- Yes
- No
- Unknown

**\*41. If a resident has diabetes how is the diabetes therapeutic menu ordered?**

- Automatically provided when patient is noted as having diabetes
- Standard menu until Dietitian orders diabetic therapeutic menu
- Standard menu until Doctor or nursing staff order diabetes therapeutic menu
- On resident or family request
- Other (please specify)

**\*42. Is the diabetes therapeutic menu designed to be consistent in carbohydrate serves at each mealtime?**

- Yes

- No
- Unknown
- Somewhat (e.g. possible but fluctuates depending on meal choice) Please comment

**\*43. Approximately how many diabetes therapeutic meals would your facility cater for at one mealtime on average?**

**\*44. How does your diabetes therapeutic menu differ to your standard menu? (Please select the answer that best applies)**

	Not offered	Restricted choice	No difference	More frequently offered	Not applicable
Fresh, frozen or tinned fruit	<input type="radio"/> Fresh, frozen or tinned fruit Not offered	<input type="radio"/> Fresh, frozen or tinned fruit Restricted choice	<input type="radio"/> Fresh, frozen or tinned fruit No difference	<input type="radio"/> Fresh, frozen or tinned fruit More frequently offered	<input type="radio"/> Fresh, frozen or tinned fruit Not applicable
Fruit juices	<input type="radio"/> Fruit juices Not offered	<input type="radio"/> Fruit juices Restricted choice	<input type="radio"/> Fruit juices No difference	<input type="radio"/> Fruit juices More frequently offered	<input type="radio"/> Fruit juices Not applicable
Fresh, frozen or tinned vegetables	<input type="radio"/> Fresh, frozen or tinned vegetables Not offered	<input type="radio"/> Fresh, frozen or tinned vegetables Restricted choice	<input type="radio"/> Fresh, frozen or tinned vegetables No difference	<input type="radio"/> Fresh, frozen or tinned vegetables More frequently offered	<input type="radio"/> Fresh, frozen or tinned vegetables Not applicable
Wholegrain breads and cereals (e.g. wholegrain)	<input type="radio"/> Wholegrain breads and cereals (e.g. wholegrain) Not offered	<input type="radio"/> Wholegrain breads and cereals (e.g. wholegrain) Restricted choice	<input type="radio"/> Wholegrain breads and cereals (e.g. wholegrain) No difference	<input type="radio"/> Wholegrain breads and cereals (e.g. wholegrain) More frequently offered	<input type="radio"/> Wholegrain breads and cereals (e.g. wholegrain) Not applicable
Low fibre choices e.g. white bread, rice bubbles	<input type="radio"/> Low fibre choices e.g. white bread, rice bubbles Not offered	<input type="radio"/> Low fibre choices e.g. white bread, rice bubbles Restricted choice	<input type="radio"/> Low fibre choices e.g. white bread, rice bubbles No difference	<input type="radio"/> Low fibre choices e.g. white bread, rice bubbles More frequently offered	<input type="radio"/> Low fibre choices e.g. white bread, rice bubbles Not applicable



	Not offered	Restricted choice	No difference	More frequently offered	Not applicable
Serves of starchy foods (e.g. breads/rice/grains/potato) at mealtimes	<input type="radio"/> Serves of starchy foods (e.g. breads/rice/grains/potato) at mealtimes Not offered	<input type="radio"/> Serves of starchy foods (e.g. breads/rice/grains/potato) at mealtimes Restricted choice	<input type="radio"/> Serves of starchy foods (e.g. breads/rice/grains/potato) at mealtimes No difference	<input type="radio"/> Serves of starchy foods (e.g. breads/rice/grains/potato) at mealtimes More frequently offered	<input type="radio"/> Serves of starchy foods (e.g. breads/rice/grains/potato) at mealtimes Not applicable
Low glycemic index breads and cereals	<input type="radio"/> Low glycemic index breads and cereals Not offered	<input type="radio"/> Low glycemic index breads and cereals Restricted choice	<input type="radio"/> Low glycemic index breads and cereals No difference	<input type="radio"/> Low glycemic index breads and cereals More frequently offered	<input type="radio"/> Low glycemic index breads and cereals Not applicable
Low fat dairy serves e.g. low fat milk and yoghurts	<input type="radio"/> Low fat dairy serves e.g. low fat milk and yoghurts Not offered	<input type="radio"/> Low fat dairy serves e.g. low fat milk and yoghurts Restricted choice	<input type="radio"/> Low fat dairy serves e.g. low fat milk and yoghurts No difference	<input type="radio"/> Low fat dairy serves e.g. low fat milk and yoghurts More frequently offered	<input type="radio"/> Low fat dairy serves e.g. low fat milk and yoghurts Not applicable
Full fat dairy serves e.g. full cream milk	<input type="radio"/> Full fat dairy serves e.g. full cream milk Not offered	<input type="radio"/> Full fat dairy serves e.g. full cream milk Restricted choice	<input type="radio"/> Full fat dairy serves e.g. full cream milk No difference	<input type="radio"/> Full fat dairy serves e.g. full cream milk More frequently offered	<input type="radio"/> Full fat dairy serves e.g. full cream milk Not applicable
No added sugar drinks e.g. diet cordial	<input type="radio"/> No added sugar drinks e.g. diet cordial Not offered	<input type="radio"/> No added sugar drinks e.g. diet cordial Restricted choice	<input type="radio"/> No added sugar drinks e.g. diet cordial No difference	<input type="radio"/> No added sugar drinks e.g. diet cordial More frequently offered	<input type="radio"/> No added sugar drinks e.g. diet cordial Not applicable

	Not offered	Restricted choice	No difference	More frequently offered	Not applicable
Sugar sweetened beverages e.g. hot chocolate, regular cordial	<input type="radio"/> Sugar sweetened beverages e.g. hot chocolate, regular cordial Not offered	<input type="radio"/> Sugar sweetened beverages e.g. hot chocolate, regular cordial Restricted choice	<input type="radio"/> Sugar sweetened beverages e.g. hot chocolate, regular cordial No difference	<input type="radio"/> Sugar sweetened beverages e.g. hot chocolate, regular cordial More frequently offered	<input type="radio"/> Sugar sweetened beverages e.g. hot chocolate, regular cordial Not applicable
No added sugar desserts e.g. diet jelly	<input type="radio"/> No added sugar desserts e.g. diet jelly Not offered	<input type="radio"/> No added sugar desserts e.g. diet jelly Restricted choice	<input type="radio"/> No added sugar desserts e.g. diet jelly No difference	<input type="radio"/> No added sugar desserts e.g. diet jelly More frequently offered	<input type="radio"/> No added sugar desserts e.g. diet jelly Not applicable
Desserts and condiments containing sugar	<input type="radio"/> Desserts and condiments containing sugar Not offered	<input type="radio"/> Desserts and condiments containing sugar Restricted choice	<input type="radio"/> Desserts and condiments containing sugar No difference	<input type="radio"/> Desserts and condiments containing sugar More frequently offered	<input type="radio"/> Desserts and condiments containing sugar Not applicable
Sweet biscuits and cakes	<input type="radio"/> Sweet biscuits and cakes Not offered	<input type="radio"/> Sweet biscuits and cakes Restricted choice	<input type="radio"/> Sweet biscuits and cakes No difference	<input type="radio"/> Sweet biscuits and cakes More frequently offered	<input type="radio"/> Sweet biscuits and cakes Not applicable
Morning and afternoon tea	<input type="radio"/> Morning and afternoon tea Not offered	<input type="radio"/> Morning and afternoon tea Restricted choice	<input type="radio"/> Morning and afternoon tea No difference	<input type="radio"/> Morning and afternoon tea More frequently offered	<input type="radio"/> Morning and afternoon tea Not applicable
Supper	<input type="radio"/> Supper Not offered	<input type="radio"/> Supper Restricted choice	<input type="radio"/> Supper No difference	<input type="radio"/> Supper More frequently offered	<input type="radio"/> Supper Not applicable

**\*45. What has led to the provision of a separate therapeutic menu for diabetes management? (Please select those that apply)**

- Historically always been offered
- Physician led decision
- Dietitian led decision
- Food service department decision
- Decision based on resident feedback/preferences
- Reduce risk of malnutrition
- Improved diabetes management e.g. blood glucose levels
- Diabetes management guidelines
- Menu guidelines
- Other (please specify)

**End of survey**

**APPENDIX 6 - MEAL OBSERVATION FIELD NOTES**

**Some General information to assist observations:**

Layout of the dining room

Routine for meal choice collection

Routine for meal delivery

Routine for meal collection

Times for meal duration

Were residents aware of what meals were being served?

Did they get what they ordered?

Type of diet each resident is on

Number of staff members available to assist

Type of staff member i.e. nurse, care/food service staff/volunteer

Amount eaten (Visual, weighed amounts will later be added also)

Social interaction (nature of), assistance provided, by whom, how long?

What happened before/after meals?

Were there any meal interruptions – from whom/what?

Were comments re diabetes management made during the mealtime?

**Room Schematic:**

**Observation Collection Form**

Date: \_\_\_\_\_ Location code: \_\_\_\_\_

Observer: \_\_\_\_\_

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Time	Observations
<hr/>	

---

**General comments/reflection:**

## **Meal observation information letter and consent form**

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## RESIDENT INFORMATION SHEET

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### Mealtime experience and food choices for older adults with diabetes in residential aged care

**Investigators:**

Mrs Olivia Farrer  
Nutrition and Dietetics  
Flinders University  
Ph: 08 8204 7074

**Supervisor(s):**

Prof Michelle Miller  
Nutrition and Dietetics  
Flinders University  
Ph: 08 8204 5328

Dr Alison Yaxley  
Nutrition and Dietetics  
Flinders University  
Ph: 08 8204 4645

A/Prof Karen Walton  
School of Medicine  
University of Wollongong  
Ph: 02 4221 5197

**Description of the study:**

This project is part of PhD studies and entitled 'Mealtime experience and food choices for older adults with diabetes in residential aged care'. This project will investigate the experiences of older adults with diabetes at mealtimes and in their food choices as residents of aged care facilities. This study is supported by Flinders University Nutrition and Dietetics department.

**Purpose of the project:**

This project aims to find out

- What enablers and barriers for optimal oral intake may be present during mealtimes or in making food choices for residents with diabetes
- What personal health beliefs may impact on optimal oral intake for residents with diabetes

**What will I be asked to do?**

If you reside in an aged care facility full time; you are invited to participate in mealtime observation(s) whereby the research dietitian will observe your interactions with staff, other residents and discussion around the meals you are presented at specific mealtimes at your aged care facility over a 3 day period. The observation will be for the whole meal duration and may also include observing discussion occurring whilst selecting menu items for future meals. Observations require no action on your behalf, only to select usual or preferred foods and consume as normal. This is voluntary and you do not have to agree to participate.



**What benefit will I gain from being involved in this study?**

The sharing of your experiences may improve the planning and delivery of future food service policy documents relating to diabetes. We are very keen to deliver a service and resources which are as appropriate and acceptable as possible to people.

**Will I be identifiable by being involved in this study?**

For the purposes of the observation study only basic demographic information will be collected along with your consent, none of the information will be identifiable. The information collected will be stored on a password protected computer that only the coordinator (Mrs Olivia Farrer) will have access to.

**Are there any risks or discomforts if I am involved?**

The investigator anticipates few risks from your involvement in this study as no active participation is required other than consent for discreet observation of your mealtimes. If you have any concerns regarding anticipated or actual risks or discomforts, please raise them with the investigator or an external free counselling service is available through organisations such as Beyond Blue (Tel: 1300 22 4636) or Lifeline (Tel: 13 11 14). Alternatively facility care coordinators can arrange for a review by the GP with on referral to counselling services if required.

**How do I agree to participate?**

Participation is voluntary. You are free to withdraw from the study at any time without effect or consequences. A consent form accompanies this information sheet. If you agree to participate please read and sign the form and return to me at Nutrition and Dietetics, Flinders University, Bedford Park, Adelaide SA 5402. Alternatively they will be collected at the time of meal observation at your facility.

**How will I receive feedback?**

Outcomes from the project will be summarised and given to you by the investigator if you would like to see them.

**Thank you for taking the time to read this information sheet and we hope that you will accept our invitation to be involved.**

*This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (7112). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email [human.researchethics@flinders.edu.au](mailto:human.researchethics@flinders.edu.au)*



**CONSENT FORM FOR PARTICIPATION IN RESEARCH  
BY OBSERVATION**

**Observations and experiences of food selection and mealtimes for older adults with diabetes in residential aged care – does diabetes still mean restriction?**

.....  
being over the age of 18 years hereby consent to participate as requested in the introduction letter for the research project on mealtime evaluation for residents with diabetes in residential aged care facilities.

1. I have read the information provided.
2. Details of procedures and any risks have been explained to my satisfaction.
3. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
4. I understand that:
  - I may not directly benefit from taking part in this research.
  - I am free to withdraw from the project at any time
  - While the information gained in this study will be published as explained, I will not be identified, and individual information will remain confidential.
  - Whether I participate or not, or withdraw after participating, will have no effect on any treatment or service that is being provided to me.
  - I understand that I may withdraw at any time from the observation or the research without disadvantage.
5. I have had the opportunity to discuss taking part in this research with a family member or friend.

**Participant signature.....Date.....**

I certify that I have explained the study to the volunteer and consider that she/he understands what is involved and freely consents to participation.

**Researcher name.....**

**Researcher signature.....Date.....**

**APPENDIX 7 – FOCUS GROUP INFORMATION SHEETS AND PROPOSED INTERVIEW GUIDE**

## Baby boomer Information Sheet:

School of Health Sciences  
GPO Box 2100  
Adelaide SA 5001  
Tel: 08 82045328  
Fax: 08 82046406  
Michelle.miller@flinders.edu.au  
nutrition.dietetics@flinders.edu.au  
CRICOS Provider No. 00114A

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## PARTICIPANT INFORMATION SHEET

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### Exploring Experiences of Managing Diet and Diabetes after Moving Into Residential Aged Care

#### Investigators:

Mrs Olivia Farrer  
Nutrition and Dietetics  
Flinders University  
Ph.: 08 8204 7074

Prof Michelle Miller  
Nutrition and Dietetics  
Flinders University  
Ph.: 08 8204 5328

A/Prof Karen Walton  
School of Medicine  
University of Wollongong  
Ph.: 02 4221 5197

Dr Alison Yaxley  
Nutrition and Dietetics  
Flinders University  
Ph.: 08 8204 4645

#### Description of the study:

This project is part of PhD studies and entitled 'Exploring Experiences of Managing Diet and Diabetes after Moving into Residential Aged Care'. This project aims to investigate the perceptions of older adults with diabetes on expectations for diabetes management on moving into supportive aged care facilities. This study is supported by Flinders University Nutrition and Dietetics department.

#### Purpose of the project:

This project aims to find out, if the participant were to be moving into residential aged care, their;

- Perspectives on the ideal food service and why this is important
- Preferred level of autonomy with diabetes self-management

#### What will I be asked to do?

If you have type 2 diabetes, live in the community but have considered aged care supportive living as a possibility for the future; you are invited to attend a focus group with the research dietitian who will ask you a few questions in a guided discussion about your current diet and diabetes management and your expectations for how this might continue if required to move into an aged care facility. The discussion will take about 45-60 minutes and will be recorded using a digital voice recorder to help with looking at the results. Once recorded, the interview will be transcribed (typed-up) and stored as a computer file and then destroyed once the results have been finalised.

A second researcher, A/Prof Karen Walton, may also be present to observe non-verbal cues and body language. This is voluntary and you do not have to agree to participate.

**What benefit will I gain from being involved in this study?**

The sharing of your experiences may improve the planning and delivery of future food service and allied health involvement relating to diabetes. We are very keen to deliver a service and resources which are as appropriate and acceptable as possible to people.

**Will I be identifiable by being involved in this study?**

Although we will address you by name in the group and collect some basic demographic information; once the discussion has been typed-up and saved as a file, the voice file will then be destroyed and any identifying information will be removed. The data will then be typed-up and stored on a password protected computer that only the coordinator (Mrs Olivia Farrer) will have access to. Your comments or observed body language will not be linked directly to you within the report.

**Are there any risks or discomforts if I am involved?**

Other group members will be able to identify your contributions at the time of participating in the discussion and you may recognise quotes in a written account of the research activity but they will not be directly attributed to you. The investigator anticipates few risks from your involvement in this study other than potential for mild discomfort in discussing a change in living situation and independence. If you have any concerns regarding anticipated or actual risks or discomforts, please raise them with the investigator or an external free counselling service is available through organisations such as Beyond Blue (Tel: 1300 22 4636) or Lifeline (Tel: 13 11 14).

**How do I agree to participate?**

Participation is voluntary. You may answer 'no comment' or refuse to answer any questions and you are free to withdraw from the focus group at any time without effect or consequences. A consent form and outline of the questions for the discussion accompanies this information sheet. If you agree to participate please read and sign the form and return to me at Nutrition and Dietetics, Flinders University, Bedford Park, Adelaide SA 5402. Alternatively they will be collected on attendance to a focus group at your facility.

**How will I receive feedback?**

Outcomes from the project will be summarised and given to you by the investigator if you would like to see them.

**Thank you for taking the time to read this information sheet and we hope that you will accept our invitation to be involved.**

*This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project number 6651). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email [human.researchethics@flinders.edu.au](mailto:human.researchethics@flinders.edu.au)*

## Baby Boomer and Resident Consent Form



### CONSENT FORM FOR PARTICIPATION IN RESEARCH BY FOCUS GROUP

**Exploring Experiences of Managing Diet and Diabetes After Moving Into Residential Aged Care**

I .....

being over the age of 18 years hereby consent to participate as requested in the introduction letter for the research project on menu evaluation for residents with diabetes in residential aged care facilities.

1. I have read the information provided.
2. Details of procedures and any risks have been explained to my satisfaction.
3. I am aware that I should retain a copy of the Information Sheet and Consent Form for future reference.
4. I understand that:
  - I may not directly benefit from taking part in this research.
  - I am free to withdraw from the project at any time and am free to decline to answer particular questions.
  - While the information gained in this study will be published as explained, I will not be identified, and individual information will remain confidential.
  - I understand that the focus groups will be audio recorded and non-verbal cues may be observed by a second researcher, but at no time my responses will be identifiable
  - I may ask that the observation be stopped at any time, and that I may withdraw at any time from the session or the research without disadvantage.
5. I have had the opportunity to discuss taking part in this research with a family member or friend.

Participant signature.....Date.....

I certify that I have explained the study to the volunteer and consider that she/he understands what is involved and freely consents to participation.

Researcher name.....

Researcher signature.....Date.....

*NB: Two signed copies should be obtained.*

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*U:\Olivia Farrer PhD supervision\focus groups\Community focus groups\Participant Consent Form Farrer Modified.doc  
Updated 28 June 2006*

## Resident Information Sheet:

School of Health Sciences  
GPO Box 2100  
Adelaide SA 5001  
Tel: 08 82045328  
Fax: 08 82046406  
Michelle.miller@flinders.edu.au  
nutrition.dietetics@flinders.edu.au  
CRICOS Provider No. 00114A

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### RESIDENT INFORMATION SHEET

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#### Exploring Experiences of Managing Diet and Diabetes after Moving Into Residential Aged Care

**Investigators:**

Mrs Olivia Farrer  
Nutrition and Dietetics  
Flinders University  
Ph.: 08 8204 7074

A/Prof Karen Walton  
School of Medicine  
University of Wollongong  
Ph.: 02 4221 5197

**Supervisor(s):**

Prof Michelle Miller  
Nutrition and Dietetics  
Flinders University  
Ph.: 08 8204 5328

Dr Alison Yaxley  
Nutrition and Dietetics  
Flinders University  
Ph.: 08 8204 4645

A/Prof Karen Walton  
School of Medicine  
University of Wollongong  
Ph.: 02 4221 5197

**Description of the study:**

This project is part of PhD studies and entitled 'Exploring Experiences of Managing Diet and Diabetes after Moving into Residential Aged Care'. This project will investigate the experiences of older adults with change in dietary habits and diabetes management on moving into supportive aged care facilities. This study is supported by Flinders University Nutrition and Dietetics department.

**Purpose of the project:**

This project aims to find out if moving into residential aged care

- Changes the types or volumes of food eaten which might then have an impact on diabetes management and
- Resident perspectives on the ideal food service and why this is important

**What will I be asked to do?**

If you have type 2 diabetes and reside in a Helping Hand facility full time; you are invited to attend a focus group with the research dietitian who will ask you a few questions in a guided discussion about your eating habits and diabetes management before and after moving into your aged care facility. The discussion will take about 45-60 minutes and will be recorded using a digital voice



recorder to help with looking at the results. Once recorded, the interview will be transcribed (typed-up) and stored as a computer file and then destroyed once the results have been finalised. A second researcher, A/Prof Karen Walton, may also be present to observe non-verbal cues and body language. This is voluntary and you do not have to agree to participate.

#### **What benefit will I gain from being involved in this study?**

The sharing of your experiences may improve the planning and delivery of future food service policy documents relating to diabetes. We are very keen to deliver a service and resources which are as appropriate and acceptable as possible to people.

#### **Will I be identifiable by being involved in this study?**

Although we will address you by name in the group and collect some basic demographic information; once the discussion has been typed-up and saved as a file, the voice file will then be destroyed and any identifying information will be removed. The data will then be typed-up and stored on a password protected computer that only the coordinator (Mrs Olivia Farrer) will have access to. Your comments or observed body language will not be linked directly to you within the report.

#### **Are there any risks or discomforts if I am involved?**

Other group members will be able to identify your contributions at the time of participating in the discussion and you may recognise quotes in a written account of the research activity but they will not be directly attributed to you. The investigator anticipates few risks from your involvement in this study other than potential for mild discomfort in discussing your life prior to entering a Helping Hand facility. If you have any concerns regarding anticipated or actual risks or discomforts, please raise them with the investigator or an external free counselling service is available through organisations such as Beyond Blue (Tel: 1300 22 4636) or Lifeline (Tel: 13 11 14). Alternatively Helping Hand care coordinators can arrange for a review by the GP with on referral to counselling services if required.

#### **How do I agree to participate?**

Participation is voluntary. You may answer 'no comment' or refuse to answer any questions and you are free to withdraw from the focus group at any time without effect or consequences. A consent form and outline of the questions for the discussion accompanies this information sheet. If you agree to participate please read and sign the form and return to me at Nutrition and Dietetics, Flinders University, Bedford Park, Adelaide SA 5402. Alternatively they will be collected on attendance to a focus group at your facility.

#### **How will I receive feedback?**

Outcomes from the project will be summarised and given to you by the investigator if you would like to see them.

**Thank you for taking the time to read this information sheet and we hope that you will accept our invitation to be involved.**

*This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee (Project number 6651). For more information regarding ethical approval of the project the Executive Officer of the Committee can be contacted by telephone on 8201 3116, by fax on 8201 2035 or by email [human.researchethics@flinders.edu.au](mailto:human.researchethics@flinders.edu.au)*

## **Proposed focus group questions:**

### **Exploring Experiences of Managing Diet and Diabetes after Moving Into Residential Aged Care**

This study aims to examine how moving from independent living to residential aged care may change usual eating habits and diabetes management. The discussion will be an opportunity to give views on what you feel an ideal food service would look like based on your knowledge and experience of managing your diabetes.

---

In our discussion with you and other participating members of the community, we would like hear your views on the following topics

- Your knowledge of diabetes and dietary management
- Your own diabetes management, particularly relating to diet and self-management techniques
- Your prior education on diabetes
- Your opinion of what the management of aged care residents with diabetes should look like i.e. frequency of blood glucose monitoring
- Your opinion of what an ideal food service and diet would look like e.g. meal timing, dining environment, meal choices and size

If you prefer not to participate in answering questions on any of the topics that is perfectly acceptable

Thank you for your time and participating in this study

**APPENDIX 8 – FOCUS GROUP PARTICIPANT DEMOGRAPHIC  
INFORMATION QUESTIONS**

## Baby boomer demographic information:

### Background Information

So that we can group the common themes that may come from our discussion, please could you take 5 minutes to complete the following demographics form. Thank you.

Gender:

- Male  Female

Age:

- <65 years  
 65 – 69 years  
 70-74 years  
 75 – 79 years  
 80 – 84 years  
 85 – 89 years  
 >90yrs

What is the highest level of education you have completed?

- Year 10 (or 4<sup>th</sup> form) at school  
 Year 12 (or 6<sup>th</sup> form) at school  
 Trade qualification  
 University degree  
 Postgraduate qualification  
 Higher Research degree  
 Other

Diabetes:

- Type 1 diabetes  
 Type 2 diabetes

How long have you had diabetes?.....

Diabetes Management (tick all that apply):

- Nil  
 Exercise  
 Diet  
 Medication  
 Insulin

Have you previously received advice regarding your diabetes management?

- Yes  No

If yes, who have you received advice from?

- GP  
 Endocrinologist  
 Nursing staff  
 Dietitian  
 Diabetes Educator  
 Other

How would you rate your current weight management?

- I have been losing weight intentionally  
 I have lost weight unintentionally  
 I am my usual weight with no recent changes  
 I have been gaining weight intentionally  
 I have gained weight unintentionally

Generally, I would describe my appetite as:

- Great, I usually eat all of my meals  
 Average, I usually eat most of my meals  
 OK, I usually eat at least half of my meals  
 Poor, I often leave most of my meals

Thank you for this information and your participation in the focus group

## Resident demographic information:

### Background Information:

So that we can group the common themes that may come from our discussion, please could you take 5 minutes to complete the following demographics form. Thank you.

Gender:

- Male  Female

Age:

- <65 years  
 65 – 69 years  
 70-74 years  
 75 – 79 years  
 80 – 84 years  
 85 – 89 years  
 >90yrs

What is the highest level of education you completed?

- Year 10 (or 4<sup>th</sup> form) at school  
 Year 12 (or 6<sup>th</sup> form) at school  
 Trade qualification  
 University degree  
 Postgraduate qualification  
 Higher Research degree  
 Other

Marital Status: (options from ABS census 2011)

- Married / De facto  
 Separated  
 Divorced  
 Widowed  
 Never Married

Number of years living in Australia:

- Born in Australia  
 1-9  
 10-29  
 30-49  
 50 or more

What is your nationality:.....

Length of time you have lived in a residential facility:

- < 6 months
- 6 months – 2 years
- 2-5 years
- 5-10 years
- > 10 years

Before moving into residential aged care had you received a meal delivery service e.g. Meals on wheels?

- Yes
- No

Who did the majority of the cooking in your household prior to moving into residential aged care?

- I did it myself
- Partner
- Family member
- Friend
- I receive delivered meals only
- Other .....

Diabetes:

- Type 1 diabetes
- Type 2 diabetes

How long have you had diabetes?.....

Diabetes Management (tick all that apply):

- Nil
- Exercise
- Diet
- Medication
- Insulin

Have you previously received advice regarding your diabetes management?

- Yes  No

If yes, who have you received advice from?

- GP  
 Endocrinologist  
 Nursing staff  
 Dietitian  
 Diabetes Educator  
 Other

How would you rate your current weight management?

- I have been losing weight intentionally  
 I have lost weight unintentionally  
 I am my usual weight with no recent changes  
 I have been gaining weight intentionally  
 I have gained weight unintentionally

Generally, I would describe my appetite as:

- Great, I usually eat all of my meals  
 Average, I usually eat most of my meals  
 OK, I usually eat at least half of my meals  
 Poor, I often leave most of my meals

Thank you for this information and your participation in the focus group

<End of Thesis>