

Effectiveness and acceptability of two dietary interventions in African women in diaspora.

ADEBOYE, B.O.

2019

The author of this thesis retains the right to be identified as such on any occasion in which content from this thesis is referenced or re-used. The licence under which this thesis is distributed applies to the text and any original images only – re-use of any third-party content must still be cleared with the original copyright holder.

**EFFECTIVENESS AND ACCEPTABILITY OF TWO DIETARY
INTERVENTIONS IN AFRICAN WOMEN IN DIASPORA**

BRIDGET ONYETCHIGOZIRI ADEBOYE

Ph. D

2019

**EFFECTIVENESS AND ACCEPTABILITY OF TWO DIETARY
INTERVENTIONS IN AFRICAN WOMEN IN DIASPORA**

BRIDGET ONYECHIGOZIRI ADEBOYE

Thesis submitted in partial fulfilment of the
requirements of the
Robert Gordon University
for the degree of Doctor of Philosophy

November 2019

Declaration

I declare that the work presented in this thesis is my own, except where otherwise acknowledged, and has not been submitted in any form for another degree or qualification at any other academic institution.

Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

Bridget Onyechigoziri Adeboye

Abstract

Obesity disproportionately affects women of ethnic minorities, especially those of African descent, living in the United Kingdom (UK). The Organisation for Economic Co-operation and Development (OECD) has estimated that obesity rates are 13% higher among African women when compared with their Caucasian counterparts, living in the UK. It has been documented that increased obesity in the immigrant population is primarily driven by post-migration dietary changes combined with decreased physical activity, which are characteristic of contemporary Western lifestyles.

One of the means of tackling obesity is through dietary interventions and lifestyle changes. The effectiveness of a High Protein Low Carbohydrate diet (HPLC) and of a Calorie Deficit Diet (CDD) on achieving weight loss and subsequently maintaining a healthy weight have been tested mainly on Caucasian subjects, but not so much with the African diaspora. There is a lack of evidence to inform the dietary intervention for certain ethnic groups that reside in Northeast Scotland, of which Africans are an integral part of the growing population.

A mixed method approach was adopted in this study: (1) A focus group to gather information about the best approach for recruitment and follow-up within the population of interest; (2) Quantitative Feasibility Study of dietary interventions, using a 600 Calorie Deficient Diet (CDD) and a High Protein Low Carbohydrate (HPLC) diet over a 12-week active dietary intervention with a population of obese African women in North-east of Scotland; (3) A semi-structured telephone interview with selected participants at the end of a 6-month post-dietary intervention.

The results of the study demonstrate that this population of obese African women living in the NE Scotland are internally motivated to achieve a healthy weight. Both diets were effective in achieving modest weight loss in most participants with the losses by the HPLC group being slightly higher. However, the study highlighted that barriers such as portion control, non-compliance with the diets, linked to lack of appropriate information on the energy content of African foods remain as

obstacles on the path to these women achieving and sustaining a healthy weight.

Keywords:

Obesity, women, African, Diaspora, diet, weight, Calorie Deficit Diet (CDD), High Protein Low Carbohydrate (HPLC).

Acknowledgement

The completion of this Ph.D. would not have been possible without the support, encouragement, prayers, professional and moral support of so many people I would never be able to name within this space. Your contributions are greatly appreciated and immensely acknowledge – thank you for inspiring and cheering me all the way.

My utmost gratitude goes to the Almighty God whose presence in my life has brought me thus far. All thanks be ascribed to Him for His mercy and great faithfulness that has enabled me to achieve this monumental milestone!

My deep appreciation goes to my three supervisors, Dr Winifred Eboh, Dr Giovanna Bermano and Dr Catherine Rolland. I couldn't have asked for a better supervisory team and my journey to growth would have been incomplete without you. Your conscientiousness, attention to details and constructive criticism all contributed to making me a better individual. Thank you for the emotional support too – during those times I struggled to balance my role as a mother, wife and student. I appreciate you all!

Thanks to Colin McClean for guidance with the literature review, referencing and all library matters. Things would have been a lot more difficult without your professional input. I appreciate you and all the library staff. Thank you to Neil Harrison and his team in the Gatehouse facility, for ensuring this thesis was printed and bound on time for submission, even at short notice. Thanks to Chris Yuill, for conducting the reflexive interview which had a significant impact on the research process. Your expertise in conducting interviews improved my skills as a researcher. Many thanks to Hector Williams for your help and guidance with the statistics, even at a very short notice.

To Duke Anezu and the Campus support team, I owe you my deep appreciation for keeping the environment safe during the late hours studying. To my fellow Ph.D. students too many to mention: thank you for being part of this story, for the pats on the back, inspiring words spoken in due season, smiles exchanged, and personal stories shared that encouraged me on the way. For all these, I remain

grateful and wish you all successful end to your Ph.D. journey too.

I would like to acknowledge all the African women in NE Scotland who participated in this study. Thank you for volunteering to undertake the dietary intervention and for willingly sharing your stories.

To all my friends and family that stood by me, I say a very big thank you. I could not have made this journey without you. To my mother, Mrs. Regina Eke, I am eternally grateful for your moral support and prayers which you were not hesitant to express. Thank God for keeping you alive to see this day. To my sweet Mother-in-love, late Mrs Lucy Adeboye, thank you for all your prayers while you were here. I never dreamt you will not be in this side of eternity to celebrate this achievement you had longed for. I miss you and your incessant prayers, but I am sure you will be proud to know I made it to the end. Rest on in heaven, mother!

To all my Pastors and spiritual fathers – Alloysius Ohanebo, Joseph Chike, Tony Okeke, Mike Iheanacho, Luke Duru and numerous WCCRM elders and brethren too many to name in person, I thank you for your prayers and standing by me all the way.

To my wonderful children – Oluchi, Nkechi, Uchechi and Ugochi: Thank you for your support and for putting up with my late nights and long periods away from home. Thank you for bearing with me and believing in me. I did it because of you all. I hope I have been able to make you proud, and that this will inspire you to aim for the skies. I love you all!

Finally, my sincere and heartfelt thanks to my husband, Joseph Adeboye. How can I express my gratitude enough – my bedrock! You stood strong like a tower behind me, steadfastly supporting and cheering me on all the way. You kept believing when I had no more strength to go on and refused to let me throw in the towel! I hope you will be relieved to have your wife back now. Thank you for being there for me always without complaining about the things left undone because of this project. I appreciate you and I love you more than I can express here.

TABLE OF CONTENTS

DECLARATION.....	V
ABSTRACT.....	VII
ACKNOWLEDGEMENT	IX
LIST OF FIGURES.....	XIII
LIST OF TABLES	XV
LIST OF ABBREVIATIONS AND ACRONYMS	XVII
LIST OF CONFERENCES/TRAININGS/PRESENTATIONS.....	XIX
CHAPTER ONE: INTRODUCTION.....	1
1.0 BACKGROUND TO RESEARCH CONTEXT AND LITERATURE REVIEW.....	1
1.1 BACKGROUND TO THE PHD JOURNEY	1
1.2 AIMS AND OBJECTIVES	3
1.3 LITERATURE REVIEW	6
1.4 OBESITY EPIDEMIOLOGY	7
1.5 OBESITY EPIDEMIOLOGY IN AFRICA AND AMONG AFRICAN DIASPORA.....	11
1.6 FACTORS ASSOCIATED WITH OBESITY IN AFRICAN DIASPORA	14
1.7 HEALTH IMPLICATIONS AND BURDEN OF OBESITY ON MIGRANT AFRICANS	17
1.8 DIETARY INTERVENTIONS AND MANAGEMENT OF OBESITY	21
1.9 RATIONALE FOR CHOICE OF THE TWO DIETS (HPLC AND CDD)	27
1.10 BEHAVIOURAL CHANGE IN WEIGHT MANAGEMENT – THEORETICAL UNDERPINNING.....	33
1.11 THESIS OUTLINE	35
CHAPTER TWO: RESEARCH METHODOLOGY.....	37
2.1. BACKGROUND OF RESEARCH PARADIGMS.....	37
2.2. MIXED METHOD SEQUENTIAL EXPLANATORY DESIGN.....	42
CHAPTER THREE: FOCUS GROUP.....	47
3.1 AIMS OF THE FOCUS GROUP STUDY	47
3.2 RATIONALE FOR THE USE OF FOCUS GROUP	48
3.3 METHODS.....	51
3.4 RESULTS	56
3.5 DISCUSSION.....	67
3.6 LIMITATION AND STRENGTH OF THE STUDY	70
3.7 CONCLUSION	71
3.8 KEY MESSAGES	73
CHAPTER FOUR - REFLEXIVE INTERVIEW.....	75
4.1 REFLEXIVITY.....	75
4.2 AIM.....	77
4.3 METHOD (OF ANALYSIS)	78
4.4 ANALYSIS AND FINDINGS.....	83
4.5 DISCUSSION.....	90
4.6 CONCLUSION	94
CHAPTER FIVE: DIETARY INTERVENTION FEASIBILITY STUDY	95
5.1 INTRODUCTION AND AIMS	95
5.2 METHOD	97
5.3 RESULTS	101
5.4 DISCUSSION.....	120
CHAPTER SIX: POST-INTERVENTION INTERVIEWS.....	131
6.1 BACKGROUND AND RATIONALE FOR POST-INTERVENTION INTERVIEWS	131
6.2 METHODS.....	133
6.3 RESULTS/FINDINGS.....	138

6.4	DISCUSSION	170
6.5	SUMMARY	177
CHAPTER SEVEN: KEY FINDINGS - CONTRIBUTIONS, RECOMMENDATIONS AND CONCLUSION		179
7.1	STUDY OVERVIEW	179
7.2	REFLECTION ON KEY FINDINGS	182
7.3	ORIGINALITY AND CONTRIBUTION TO KNOWLEDGE	191
7.4	RECOMMENDATION AND SUGGESTED FUTURE WORK	196
7.5	STRENGTHS AND LIMITATIONS OF THE STUDY.....	198
7.6	SUMMARY AND CONCLUSIONS.....	199
REFERENCES.....		201
APPENDIX A: FOCUS GROUP FLYER.....		247
APPENDIX B: FOCUS GROUP CONSENT FORM		248
APPENDIX C: INFORMATION SHEET FOR FOCUS GROUP		249
APPENDIX D: FOCUS GROUP DEMOGRAPHIC FORM.....		252
APPENDIX E: FOOD DIARIES.....		253
APPENDIX F: REFLECTIVE JOURNAL SAMPLES.....		265
APPENDIX G: REFLEXIVE INTERVIEW TRANSCRIPT		269
APPENDIX H: HPLC DIETETIC BOOKLET		280
APPENDIX I: ETHICAL APPROVAL FOR FEASIBILITY STUDY.....		292
APPENDIX J: ETHICAL APPROVAL FOR POST INTERVENTION INTERVIEWS.....		293
APPENDIX K: INFORMATION SHEET & CONSENT FORM		294
APPENDIX L: POST INTERVENTION QUESTIONS		297
APPENDIX M: LETTER TO GP #1		299
APPENDIX N: LETTER TO GP #2.....		300

List of Figures

Figure 1.1 Past and projected trends in the prevalence of adult overweight (including obesity), in selected developed countries.....	8
Figure 1. 2 Obesity by ethnic group in England (adults) (Source: OECD 2011)9	
Figure 1. 3 Proportion of adults overweight and obese in Scotland 2003-2016 (ages 16+) Source: Scottish Health Survey (Scottish Government 2014).	10
Figure 2. 1 A diagram summarising the mixed method sequential exploratory design used in this study.....	43
Figure 3. 1 Overview of the focus group study.....	48
Figure 5. 1 Overview of the dietary intervention feasibility study	96
Figure 5. 2 Participants flow chart	102
Figure 5. 3 Participants' key measurements and BMI at baseline and post intervention	112
Figure 5. 4 Changes for key parameters during intervention (Visceral fat change)	113
Figure 5. 5 Changes for key parameters during intervention (BOCF).....	117
Figure 6. 1 Chronological Display of Post-Interview Themes.....	139
Figure 6. 2 Themes and sub-themes of readiness for weight loss.....	140
Figure 6. 3 Themes and sub-themes within intervention.....	145
Figure 6. 4 External factors	146
Figure 6. 5 Internal factors.....	151
Figure 6. 6 Post-intervention themes	163

List of Tables

Table 1.1 Increased prevalence of diseases associated with predicted increases in obesity levels by 2030 assuming no effective obesity prevention. Source: Scottish Health Survey (The Scottish Government 2014).	10
Table 1.2 Key characteristics of studies included in Osei-Assibey and Boachie (2012) review on dietary interventions for weight loss and cardiovascular risk reduction in blacks.....	29
Table 1. 3 List of studies and diets included in Hession et al, (2009) review - Adapted from Hession et al 2009.....	32
Table 3. 1 Focus group interview guide and prompts	54
Table 3.2 Focus group participants' characteristics.....	57
Table 4. 1 The "I" poem extract	87
Table 4. 2 Contrapuntal voices of researcher as the respondent	89
Table 5.1 Calculating BMR using the Schofield equation	95
Table 5.2 Information of excluded participants and of non-completers with reasons for discontinuing.....	103
Table 5.3 Participants' demographics (completers)	104
Table 5.4 Participants' demographics (non-completers).....	105
Table 5.5 Anthropometric characteristics of completers in the HPLC group before and after intervention.....	107
Table 5.6 Anthropometric characteristics of completers in the CDD group before and after intervention.....	108
Table 5.7 Independent t-Test Statistical Analysis Results	109
Table 5.8 Changes for all parameters during intervention	112
Table 5.9 BOCF (Base Observation Carried Forward) Analysis - HPLC.....	115
Table 5.10 BOCF (Base observation carried forward) Analysis - CDD	116
Table 5.11 Pre and post-intervention measurement and percentage changes with BOCF	117
Table 5.12 t-Test Analysis of key parameters inc non-completers	118
Table 6. 1 Post-intervention interview questions	136

List of Abbreviations and Acronyms

AIDS - Acquired Immune Deficiency Syndrome
ANOVA – Analysis of Variance
BMI – Body Mass Index
CDD - Calorie Deficit Diet
CINAHL - Cumulative Index to Nursing and Allied Health Literature
CORE - Centre for Obesity Research and Education
CVD - cardiovascular diseases
DASH -
GP – General Practitioner
HBM - Health Belief Model
HDL-cholesterol
HipC – Hip Circumference
HIV - Human Immunodeficiency Virus
HPLC - High Protein Low Carbohydrates
HSE - Health and Survey for England
IGF-1 (Insulin-like hormone produced in the pancreas by humans)
ISAK – International Society of the Advancement of Kinanthropometry
LCD - Low-calorie diet
LCHOD - Low-carbohydrate non-ketogenic diets
LCKD - Low carbohydrate ketogenic diets
LFDs - Low-Fat Diets
LG - Listening Guide
MRC - Medical Research Council
MSc – Master of Science
NCEP - National Cholesterol Education Program
NE Scotland - North East Scotland
NHS - National Health Service
NICE – National Institute for Health and Clinical Excellence
NIH - National Institutes of Health
NOO - National Obesity Observatory
obese West African women

OECD - Organisation for Economic Co-operation and Development countries
Ph.D – Doctor of Philosophy
PSFM - Protein Sparing Modified Fast
SAD – Sagittal Abdominal Diameter
SAT - Subcutaneous Adipose Tissue
SCT - Social Cognitive Theory
SD – Standard Deviation
SEM - Social Ecological Model
SHeS – Scottish Health Survey
SSA - sub-Saharan Africa
T2D - Type 2 Diabetes
TTM - The Transtheoretical Model/Stages of Change
UK – United Kingdom
US – United States
USA – United State of America
VAT - Visceral Adipose Tissue
VLCD - Very low-calorie diet
WC – Waist Circumference
WHO – World Health Organisation
WPR - World Population Review

List of Conferences/Trainings/Presentations

RGU Graduate School Poster Presentation, May 2012

University of Oxford: Introduction to Focus groups - March 2013

University of Oxford – Analysing Qualitative Interviews – April 2013

CHAPTER ONE: INTRODUCTION

1.0 Background to research context and literature review

This chapter focuses on the key assumptions underlying this study, the research problems, and aims and objectives. It will give an overview introduction to the aetiology of, and factors influencing obesity, health implications and burden of obesity on migrant African women, as well as current treatment of obesity and weight management. The chapter will also provide an overview of the organisation (layout) of the thesis chapters.

1.1 Background to the PhD Journey

The author's interest in obesity among African women in diaspora dates to 2010 as a postgraduate student of the MSc in Obesity Science and Management in the Centre for Obesity Research and Education (CORE). As an African woman herself in diaspora who migrated from Nigeria, West Africa, to North East (NE) Scotland a decade earlier, accompanying her spouse on a work transfer, she was astonished by her weight gain of over 20% during that time. This led to a search for how to sustainably manage weight at a healthy level.

This search highlighted the epidemiological prevalence of obesity and related diseases burden in the African continent and showed that the problem was fast growing, with the female population suffering greater impact (Ziraba et al, 2009; WHO, 2011; Adeboye et al, 2012; Neupane et al, 2014; Bhurosy, and Jeewon, 2014; Amugsi et al, 2017). It has also been identified, in published literature, that ethnic minority women in diaspora have higher prevalence of obesity when compared to other groups or even their Caucasian counterparts in the host country. Understanding this public health issue firstly from the author's own personal experience and subsequently looking at obesity in African women led to many questions about the management of obesity amongst this population and asking the question about the help provided to achieve weight loss and its effectiveness.

It was whilst looking for possible dietary interventions for herself that the author

realised that there were only set diets made available through the National Health Service (NHS) within the environs of NE Scotland where she lived. These were the High Protein Low Carbohydrates (HPLC) and the Calorie Deficit Diet (CDD) – (Gibbs et al 2002; Rolland et al 2009). Given the complexities of weight loss and gain and the factors that influence individual lifestyle choices, especially around what is perceived as healthy weight and diets, the author was drawn into looking at theories that underpin lifestyle choices which ultimately impacted on weight, obesity and related morbidities.

The evidence of changing perceptions about obesity, general dissatisfaction with body image among obese West African women (Duda et al 2007; Nenkeser, Biritwum and Hill 2012) and increased availability of information about the negative impact of obesity on health suggest that a percentage of this population will seek help and intervention to achieve and sustain a healthier weight (Duda et al 2007; Nenkeser, Biritwum and Hill 2012). An investigation of the effectiveness and acceptability of two dietary interventions that are routinely used for weight management in obesity specialist clinics in the NE of Scotland yielded valuable insight into the likelihood of success for those in this population seeking interventions. Prior to this time, the effectiveness of the HPLC and CDD on achieving weight loss and subsequently maintaining a healthy weight have only been tested on Caucasian subjects (Hession et al 2009).

Capturing the complexities of dieting, weight loss/gain, attitudes towards obesity and related complications in this population required the use of research methods that were sensitive to eliciting, illuminating and making sense of findings. To this end, various research methods were explored including the Medical Research Council's (MRC) recommended framework for researching complex interventions. However, this method adopts a positivist approach which provides clear answers about effectiveness of weight loss when comparing two distinct dietary interventions but does not explore the deeper cultural, societal and behavioural factors that are crucial to gaining a holistic view of why dietary interventions succeed or fail. Therefore, a combination of positivist and interpretivist approaches was employed.

1.2 Aims and Objectives

1.2.1 Research Aim

The overarching aim of this study was to explore the effectiveness and acceptability of two dietary interventions, HPLC and CDD, amongst obese African women living in NE Scotland. The primary outcome will be weight loss achieved within the two dietary groups at the end of a 12-weeks dietary intervention which will be an indication of effectiveness, while assessing the acceptability of the given diets by exploring participants' lived experiences. This approach is novel as to the best of the researchers' knowledge, it has not been done exclusively with the African women in diaspora.

By using a mixed methods approach, the study aims to provide specific information about the effectiveness of the two dietary regimens and more general information about factors which could improve acceptability and success in weight management that may be extrapolated to different ethnic groups. The use of semi-structured interviews aims to provide insight into participants' weight loss experiences and highlight factors and barriers encountered.

1.2.2 Objectives

The objectives of this study include the following:

- To explore lifestyle choices that influence dietary intakes.
- To assess the acceptability and effectiveness of two dietary interventions.
- To explore with participants their lived experiences of the two dietary interventions.
- To summarise findings and inform guidelines to provide awareness of key issues/factors and recommendations to best implement weight loss programme in West African women in diaspora.

1.2.3 Research Question

With the rapid increase in the prevalence of obesity and the associated severe health and socioeconomic consequences within the African populations, especially women (Ogden et al 2006; Cappuccio et al 2008; Ziraba, et al 2009; Agyemang et al 2009; Adeboye et al 2012), the search for effective weight loss intervention becomes paramount. However, this is both a clinical and a public health challenge, as evidence from trials indicates that people of African descent underachieve in weight management programmes compared with Caucasians (Hong et al 2005; Parikh et al 2006; Kumanyika 2008). Various reasons have been proposed for this, including social and cultural barriers, such as differential body-image ideals, cultural food attitudes, fewer role models for physical activity, and normative views of overweight and obesity (Fezeu et al, 2006; Jackson et al 2007; Fitzgibbon et al, 2012; Osei-Assibey and Boachie 2012).

Moreover, differences in abdominal adipose tissue distributions to total body mass between black and Caucasians may affect weight loss (Hardy et al, 2012; Usman, 2019). Numerous studies have shown black women to have less Visceral Adipose Tissue (VAT) and more Subcutaneous Adipose Tissue (SAT) than the Caucasian women, and were more insulin-resistant, even at the same BMI (Goedecke et al, 2009; Chandler-Laney et al, 2011), which has been linked to development of type 2 diabetes (T2DM), increased risk of obesity (weight gain) and may impede weight loss success (Hardy et al, 2012; Usman et al, 2019).

Unfortunately, there is currently a lack of research on dietary interventions for weight loss best suited to the African population in diaspora (Osei-Assibey and Boachie 2012) or for that matter other ethnic populations who live away from their countries of origin. It is not enough to assume that diets used within Caucasian populations will meet the needs of this subgroup (see more details under the dietary intervention section). To this end, it is then imperative to carry out the proposed study with the overarching research question:

- In African women with obesity living in NE Scotland, are HPLC and CDD diets

acceptable and effective in inducing weight loss?

- It is hypothesized that this target group will experience greater weight loss in the HPLC than those in the standard CDD. It is also predicted that the women in both dietary intervention group will not have difficulties adhering to the dietary regimes.

1.2.4 Identification and definition of terms in relation to this study

Classification of minority communities with certain terms in epidemiological research remain a contentious debate (Agyemang, Bhopal and Bruijnzeels, 2005). Historically, the subject surrounding labelling and stereotyping group of people based on language, colour of the skin or similar attributes have been shown to somewhat conceal the heterogeneity within these groups, obscures understanding of the basis of ethnic differences in diseases, invariably hampering provision of appropriate health care needs (Agyemang, Bhopal and Bruijnzeels, 2005). Hence, it is necessary to define from the onset any terms adopted to identify groups in society and placed in context (Serrant-Green, 2002; Agyemang, Phopal and Bruijnzeels, 2005), as highlighted below.

Diasporas can be defined as "national migrant communities living in interaction among themselves and with their country of origin" (Assogba, 2002). According to the African Union, the African Diaspora is composed of "people of African origin living outside of the continent, irrespective of their citizenship and nationality, and who are willing to contribute to the development of the continent and the building of the African Union" (Ajayi, 1998; Assogba, 2002).

'Black' is often used as a political term to identify individuals with sub-Saharan African ancestral origins, African-Caribbean and South Asian origin, with brown or black complexion (Serrant-Green, 2002; Agyemang, Phopal and Bruijnzeels, 2005). In some circumstances, members of the community themselves also adopts the term 'black' to represent a unified experience of racism, discrimination and prejudice among all non-white minority populations (Serrant-Green, 2002; Agyemang, Phopal and Bruijnzeels, 2005). In the UK, Black African is used in censuses, to refer to individuals, and their offspring with African ancestral origins who themselves or families migrated directly from sub-Saharan Africa (Agyemang,

Phopal and Bruijnzeels, 2005).

In the context of this research, the term African women in diaspora used to address this study population, refers to women of African descent living out with their continent, predominantly (but not exclusively) women of West African origin that now resides in North East of Scotland. Initially, this would have been forced migration as in the case of slave trade (Ajayi, 1998), however, in more recent times, migration has been predominantly for the purposes of employment and education (Luke et al, 2001). The term 'African women' and 'black African' might be used interchangeably to refer to this study population, however, 'black women' are used in several other studies referenced in this work, especially those conducted in the United State of America. This term often used to represent African American women, however, where necessary, explanation will be offered to the reference of the term 'black women' within the said study.

1.3 Literature Review

A literature review was conducted at the beginning of the study, further focused during study development, and repeated periodically throughout the period of the study.

The literature search process broadly covered studies focusing on obesity among the African diaspora, involving cultural and dietary preferences among the obese African population. It also covered the use of focus groups assessing perceptions of food choices and dietary preferences among this population. The search focused on research published from 2000 onwards, in English, and included peer reviewed articles and conference papers. Books were also considered for background research, for behavioural models and frameworks relevant to the study. The period since 2000 was chosen to capture modern research trends and to follow the publication of the WHO report "Obesity: preventing and managing the global epidemic" (WHO 2002).

The initial scoping search strategy considered "African diaspora" as the central topic, and black women and obesity more widely. During work for a previous degree, the researcher had taken a systematic review approach to the literature and was familiar with the method and the typical sources underlying such a study, Medline and CINAHL on the Ebscohost platform. The researcher used the inherent search features of the platform to explore laterally through links to subject headings, authors, journals, keywords and phrases.

Keywords were utilised in various combinations in the search, incorporating terms related to the main concepts of the study, such as "African women 'AND' obesity", "African diaspora 'AND' focus groups", "African women 'AND/OR' "food habits", "eating habits," "behaviours/behaviors", "food choices", "food preferences", "dietary interventions", "high protein low carbohydrate and calorie deficit diets", "immigration/emigration".

The EMBASE database was occasionally consulted although typically results from that source duplicated results from Medline and CINAHL. Medline and CINAHL were the primary sources that formed the basis of the literature review. A table of literature relevant to the study was created based on the initial and subsequent search topics. To ensure continued relevant coverage of current literature, subscription to Google Scholar alerts enabled receipt of email notifications regarding new literature being published online relevant to the subject area. With these leads the table of literature was updated periodically with new articles.

1.4 Obesity Epidemiology

Obesity, defined as the accumulation of excessive fat in the body and a body-mass index (BMI) ≥ 30 kg/m² (Lim et al 2012; Segal and Martin, 2016; WHO 2014), continues to pose significant public health issues and has since been recognized as reaching epidemic levels globally (Caballero 2007; Finucane et al 2011). The dramatic increase in global obesity prevalence has accelerated and more than doubled in the past two decades (Ng et al 2014; WHO 2014). In 2008, over 1.5 billion individuals over 20 years of age were estimated to be overweight, out of which over 200 million men about 300 million women were categorised as obese

(WHO 2014). It has also become a significant growing health concern in the United Kingdom (UK), with obesity being tagged as one of the leading causes of preventable mortality in the UK (WHO, 2014; Team and Niblett, 2015, National Obesity Observatory (NOO, 2011).

Within the last 25 years, the obesity prevalence among the general UK adult's population is said to have almost quadrupled, resulting in 1 in 4 people classified as clinically obese, with a BMI ≥ 30 kg/m² (WHO 2016). Within Europe (see figure 1.1), England is ranked the highest in the prevalence of obesity with rates increasing faster than in most Organisation for Economic Co-operation and Development countries (OECD 2015). Between 1993 to 2015, obesity prevalence surged from 15% to 27% and had remained at similar level since then. Similarly, the number of overweight adults in England (BMI ≥ 25 kg/m²) had increased significantly resulting to more than 68% of men and about 58% of women classified as either overweight or obese (WHO, 2016; Health and Survey for England (Craig and Mindel, 2012).

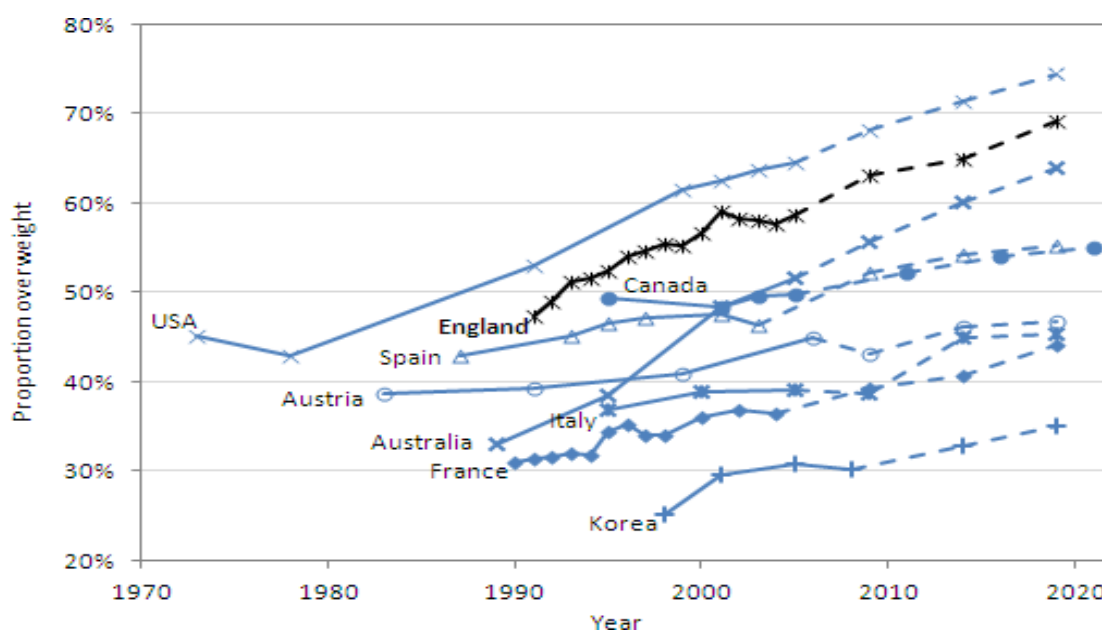


Figure 1. 1 Past and projected trends in the prevalence of adult overweight (including obesity), in selected developed countries - featuring England, United Kingdom level as highest in Europe. (Source: The Organization for Economic Cooperation and Development [OECD] 2015).

Note: England is not representative of the entire UK and Korea is supposedly represents South Korea.

In 2030, another 11 million individuals are expected to join the obese population in the UK, potentially leading up to 668,000 more cases of diabetes mellitus, 461,000 cases of cardiovascular disease and 130,000 cases of cancer (Wang et al, 2011). The additional financial burden is expected to increase by £1.9–2.0 billion per year by 2030 (Foresight, 2008; Wang et al 2011). Adult obesity rates have almost quadrupled in the last 30 years (HSE, 2011).

Data within the UK suggest that the proportion of obesity is higher in some ethnic minorities and low-income individuals (HSE, 2011). For instance, while obesity rates stood at 22.7% among the English general population, it was 25.2% amongst Black Caribbean ethnicity group (Craig and Mindell, 2012). Furthermore, utilising data from the 2003–2004 Health Surveys for England, Diaz and colleagues (2007) revealed obesity prevalence was significantly higher in black population when compared with Caucasians counterparts. Among the women, obesity rates were 13% higher among African women than European women (OECD 2011). Asian men and women, along with black men, are more likely to be obese than their white counterparts (see Figure 1.2).

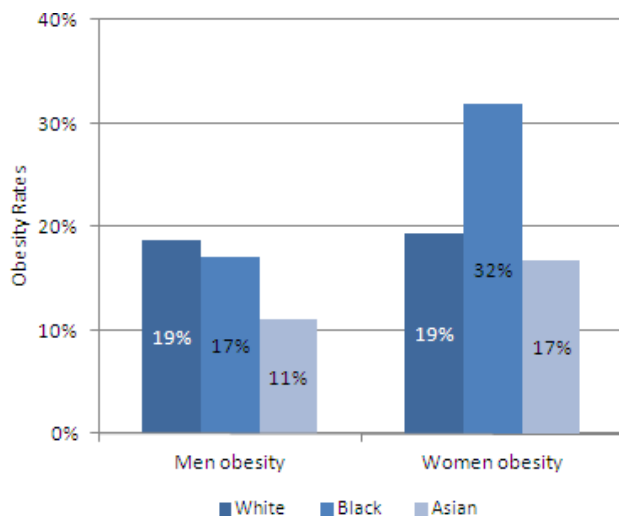


Figure 1. 2 Obesity by ethnic group in England (adults) (Source: OECD 2011)

Scotland has one of the highest occurrences of obesity for men and women among OECD countries (Scottish Government, 2014). According to Scottish Health Surveys (SHes), in 2013, 64.6% of adults aged over 16 were overweight. Of these, 27.1% were obese (Scottish Government 2014). Between 2003 and 2008, where prevalence of overweight and obesity increased from 62% to 65% (see figure 1.3 below). Rates have since stabilised (Scottish Government, 2014).

Experts are also predicting that by 2030, adult obesity in Scotland could exceed 40% irrespective of the current health improvement measures, accounting for more than 50% increase above 2008 levels (OECD 2011). The direct cost of obesity to NHS Scotland will also increase with the Scottish Government estimating it to nearly double by 2030 (Scottish Government 2010). Based on the assumption of previous estimates, the direct and indirect cost of obesity to Scottish society is projected to range from £0.9 billion to £3 billion (Scottish Government 2010). A 2014 study by McKinsey Global Institute (2014) suggested an even higher total economic impact of obesity at 3.0% of gross domestic product (GDP). Converting their estimate from dollars to pounds, and adjusting pro rata to Scotland's population size, the cost results in £4.6 billion (Scottish Government 2014). The authors' analysis considered: loss of productivity attributable to loss of life or impaired life quality, direct health care costs, and investment to mitigate the impact of obesity.

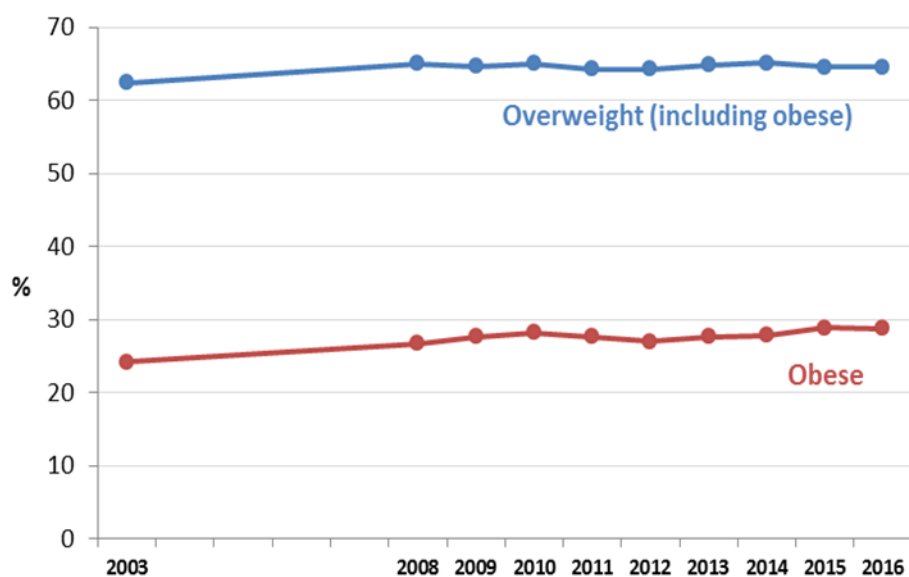


Figure 1. 3 Proportion of adults overweight and obese in Scotland 2003-2016 (ages 16+) Source: Scottish Health Survey (Scottish Government 2014).

The prevalence of obesity related conditions in Scotland is also predicted to rise exponentially by 2030 if no effective obesity prevention is taken (see table 1.1).

Table 1. 1 Increased prevalence of diseases associated with predicted increases in obesity levels by 2030 assuming no effective obesity prevention. Source: Scottish Health Survey (The Scottish Government 2014).

Condition	2003		2030		Predicted increase due to obesity
	Total cases	Total cases attributable to obesity (%)	Total cases	Total cases attributable to obesity (%)	
Hypertension	1,351,185	488,496 (36%)	1,730,561	867,872 (50%)	379,376
Angina Pectoris	249,909	40,151 (16%)	281,091	71,333 (25%)	31,182
Type 2 diabetes	139,881	87,216 (62%)	207,615	154,950 (75%)	67,734
Myocardial infarction	133,869	27,111 (20%)	154,924	48,166 (31%)	21,055
Stroke	92,252	6,174 (7%)	97,047	10,969 (11%)	4,795

1.5 Obesity Epidemiology in Africa and among African Diaspora

Over the past 25 years, urban African cities have witnessed a shocking increase in obesity levels (Adeboye et al 2012; Agyemang et al, 2016; Amugsi 2017). This unabating rise has been linked to rapid urbanization and attendant lifestyle changes such as decreased physical activity (Abubakari et al, 2008, Scott et al, 2012, Agyemang et al, 2016), often supplemented by increased intake of energy-dense as well as sugar-laden beverages. This combination has been purported as a contributory factor to the rising burden of obesity within the continent, especially in the towns and cities (Agyemang et al, 2016; WHO, 2016; Biadgilign et al, 2017). These changes in diet and lifestyle, especially in urban settings, frequently involve a consumption shift from traditional relatively low- fat, fibre-rich foods, to processed and refined foods, high in saturated fats and sugar (Lopriore and Muehlhoff 2003; Bourne, Lambert and Steyn 2002; MacIntyre et al 2002).

The consequence of urbanisation is often connected with the adoption of a westernised lifestyle, which is associated with increased intake of energy-dense

foods and high-calorie sugary meals and drinks. Urbanisation is also associated with less energy-demanding jobs, complemented by increased sedentary lifestyles and the adoption of detrimental eating habits, which include the regular consumption of fast food and so called 'eat out' (Yusuf et al 2001; Popkin 2006; Prentice 2005).

Several epidemiological studies have reported similar findings. In their quest to understand the scale of obesity problem in Africa, Amugsi and his colleagues analysed demographic and health survey data obtained over 25 years from 24 African countries. When compared with earlier survey, the data revealed a clear rise in obesity levels, especially among urban African women aged 15 and 49 years. Increase in obesity prevalence among urban women were particularly significant with over 20% rise found in four countries while the remaining stretched between 10% and 19% (Amugsi 2017).

Remarkable contrast was found between the African countries surveyed. In their latest survey, Egypt ranked the highest in obesity rise in the last 25 years with 2 out of 5 Egyptians (39%) classified as obese. This was seconded by Ghana at 22% (a 65% increase from previous rate of 8%). Although the prevalence of obesity in other African countries are not as high as that of Egypt and Ghana, the acceleration rates is still a cause for concerns. While countries like Kenya, Rwanda, Ivory Coast, Benin, Niger and Uganda had witness doubled increase, others like Zambia, Mali, Malawi, Burkina Faso and Tanzania a three-fold increase (Amugsi 2017).

Similarly, Agyemang et al (2016) assessed the burden of obesity and Type 2 Diabetes (T2D) in rural and urban Ghanaian adults, comparing it with their migrant counterparts living in Europe. Their study while revealing a high prevalence of obesity among women in the urban regions, noted a considerable increase among women in rural areas (Agyemang et al 2016). Women in rural Ghana had the lowest prevalence of obesity (8.3%), with rates among urban women considerably higher (33.9%) and highest in Europe, particularly in London (54.2%). Similar pattern was observed in the prevalence of T2D being lowest among rural Ghanaian women (5.5%), increased in urban women (9.2%) and highest among their counterparts in Berlin (10.2%). Agyemang et al (2016) findings correlate with the emerging patterns that show increased risk of obesity and T2D among sub-Saharan African population living in Urban areas and cities, and in extension among

their counterparts residing in Europe. This suggests that marked environmental factors, plus heritable susceptibility, contribute to the development of T2D among these populations (Agyemang et al 2016).

The increase of type 2 diabetes (T2D) is not only observed among migrants, but equally in low- and middle-income countries in sub-Saharan Africa (SSA) from where many of these migrants came from (Abubakari et al 2009; Mbanya et al 2010). Increasingly, T2D which was basically unheard of in SSA in the 1960s and 1980s, has emerged as a significant health threat especially in urban areas (Abubakari et al 2008; Mbanya et al 2010) with projection that SSA will likely witness swiftest growth in the number of people living with T2D globally, (141 %) in the coming two decades (Whiting et al, 2011; Ogurtsova et al, 2017). The rising gradient of T2D levels in populations of SSA origin mirrors the acceleration of major risk factors such as obesity (Abubakari et al 2008; Agyemang et al 2016).

Additionally, Adeboye et al's (2012) systematic review, which focused on epidemiological studies (surveys, case-control and cohort) with comparative subgroups, also reported similar findings. The results of this review also suggest a higher prevalence of obesity in the female population compared to their male counterparts, especially in the urban areas. This higher prevalence of obesity in women reported in Adeboye et al's (2012) review depicts the global situation in most populations of African origin, including those in diaspora (Agyemang et al 2009; Dugas et al 2009; Njelekela et al 2009). Although there is no direct comparison, about 77% of African women in diaspora are reportedly overweight or obese, typifying the female gender as the most obese group compared with their male counterparts as well as with males of all other ethnic groups (Flegal et al 2010; Craig and Mindell, 2012).

Moreover, the results of Adeboye et al's (2012) systematic review revealed a higher prevalence of obesity co-morbidities among obese individuals when compared with non-obese individuals within the African continent. In all the obesity co-morbidities reviewed; the prevalence was consistently higher in the obese individuals.

Asfaw's study suggested similarly, a clear relationship between obesity and four diagnosed chronic diseases (arthritis, asthma, diabetes and heart diseases) (Asfaw

2006). Each chronic disease was more prevalent in obese respondents than in non-obese individuals. Asfaw's comparison of the prevalence of diagnosed chronic diseases between obese and non-obese subjects also provides an indication of the effect of obesity on the prevalence of chronic diseases (Asfaw 2006). Each chronic disease included in the study was more prevalent in obese respondents than in their non-obese counterparts. In South Africa and Senegal, the results indicated that obese subjects were more likely to suffer two or more chronic diseases than their lean counterparts (Asfaw 2006). Asfaw's findings agree with numerous studies conducted in both developed and low-income countries (Yach et al, 2004; Kengne et al, 2005; Fezeu et al 2007).

1.6 Factors Associated with Obesity in African Diaspora

Causes of overweight and obesity are complex and multi-factorial, however at an individual level, a combination of excessive food energy intake and a lack of physical activity is thought to explain most cases of obesity (Benkeser, Biritwum and Hill 2012). Many obesity cases are argued to be influenced primarily by genetics, medical reasons, behavioural, environmental, social and cultural factors (Hill et al 2008; Malnick and Knobler 2006). There is a consensual agreement by scientists that obesity results from an imbalance of an individual's energy intake and energy output (Krebs et al 2007; Ali and Crowther 2010; OECD, 2017).

Genetics contributes to the likelihood of an individual storing excess energy from fat. There is a popular saying where people tend to suggest that they are fat because it "runs in our genes" (Dalton 2004, p. 46), leading to the misconception that weight gain is totally genetic. It has been argued that genetics alone cannot fully explain obesity and that individuals are not predestined to be obese. While susceptibility obesity may be genetically transmitted, environmental and behavioural (such as poor diet and sedentary lifestyle) conditions influence expression (Monda, Chen and Haiman 2010).

Two popular theories have been suggested to explain the increasing energy imbalance experienced by the African population (Duda et al 2007). These are increased urbanization and corresponding decreased physical activity as well as increased consumption of energy-dense foods and sugared beverages (WHO 2009;

Duda et al 2007). However, Benkeser et al argue that such environmental change cannot fully account for why West African women, especially those of high socioeconomic status are disproportionately affected by obesity (Benkeser, Biritwum and Hill 2012). Another theory links obesity with social and cultural desirability for overweight African women (Benkeser, Biritwum and Hill 2012).

Culture, often defined as learned patterns of behaviour and thought characteristic of a social group (Ali 2013; Artmann 2013), plays a significant role in the aetiology of obesity. From an anthropological perspective, obesity as a state is disparately viewed across cultures (Swami et al 2009). Historically, obesity was not regarded as a disease in less developed countries, instead it was held with little or no opprobrium (Walker 1998; Walker, Adams and Walker 2001) and viewed as sexually desirable; positively linked with success, wealth, beauty, evidence of good living, good health and optimal happiness (Renzaho 2004; Onayemi 2004; Holdsworth et al 2004; Siervo et al 2006; Davidson and Knafelz 2006; Monyeki et al 2010) and signifying absence of diseases such as HIV/AIDS (Mvo et al 1999; Rubin 2008).

In some African ethnic groups, female obesity is culturally acceptable for women and even encouraged before marriage (Popenoe 2003). One instance is the pre-marital "fattening rooms" of Nigeria (Brink 1995) and fattening practices among Moroccan Saharawi women (Rguibi and Belahsen 2006). In these cultures, obesity is erroneously linked to fruitfulness and fertility with preference for fuller-figured women as prospective wives (Renzaho 2004; Rguibi and Belahsen 2006).

In Mauritania, a country in Northwest Africa, premarital fattening practices still exist, where girls are force-fed in fattening farms prior to marriage (Smith 2009; Tabary 2018). It is purported that, "In Mauritania, a woman's size indicates the amount of space she occupies in her husband's heart," (Mint Ely, head of the Association of Women Heads of Households). Heavier girls are deemed more beautiful and are viewed as more desirable by Mauritanian men, hence they are more likely to be married off easily (Smith 2009; Tabary 2018). Girls as young as 7 or 8 years old are force-fed to help accelerate puberty for early marriage at the age of 13 (Tabary 2018). Following force-feeding, girls around 8 years old could weigh as much as 300lbs, placing immense strain on their hearts and triggering chronic diseases such as T2D, hypertension, heart diseases or other

obese-induced illnesses. Although these practices are less widespread in the cities due to activists' campaign and awareness, they are still viable in the rural areas (Tabary 2018).

Studies show African women as more accepting of larger body weight, viewing them as more attractive (Puoane et al 2005; Faber and Kruger 2005; Millstein et al 2008; Robinson, Webb and Butler-Ajibade 2011). When compared with Caucasians, African women were less likely to consider themselves as obese or overweight (Yancey et al 2006; Roberts et al 2006; Lofton et al 2007; Grabe et al 2008). For instance, non-Hispanic black women in the Millstein et al study were shown to be more satisfied with their body size than their non-Hispanic white counterparts (Millstein et al 2008). Similarly, Kelly et al (2005) and Zullig et al (2006) both reported that black females were more likely to report higher body satisfaction than their white counterparts.

More interestingly, Mabry and colleagues (2003) found that black adolescent girls exhibited more approval of a larger body size than their white counterparts (Mabry et al 2003). While the widespread acceptance of weight and lack of pressure to be thin both liberate and empower, the same tolerance places Black women at a higher risk of obesity (Hillsberg 2014) and impacts negatively on their readiness to embark on any weight loss intervention (Bennett and Wolin 2006; Standley et al 2009). In contrast, the preferred body profile in Western countries appear to be that of lean body size where thinness is celebrated (Levine and Smolak 2006; Calogero et al 2007) and associated with elegance, attractiveness and self-control with women of higher socioeconomic backgrounds less likely to be obese (Metcalf et al 2000).

Caprio et al, 2008 suggest that individuals from developing countries continue to maintain preference for larger body size post migration, however, Ogana and Ojong (2013) report a marked trend of increasing number of young African women aspiring to the thin ideal. Similarly, other studies conducted on urban Ghanaian women reports a general dissatisfaction with an obese body (Duda et al 2007; Benkeser, Biritwum and Hill 2012) suggesting that women in general prefer a normal weight as defined by BMI, especially if it improves health outcomes. However, Duda et al report that older women in this study were less willing to lose weight for health; implying age might be a factor (Duda et al 2007).

1.7 Health Implications and Burden of Obesity on Migrant Africans

Obesity is a major risk factor for several diseases, including cardiovascular diseases (CVD), T2D, hypertension, certain cancers, and musculoskeletal disorders (Malnick and Knobler 2006; Pi-Sunyer 2009; WHO 2011). Annually, approximately 2.8 million deaths occur because of overweight and obesity globally (WHO 2011). These diet-related illnesses have placed a huge burden on global economies. For instance, the annual healthcare cost of diet related conditions such as obesity, hypertension, and T2D, in the UK, are estimated at £5.8 billion (Scarborough et al 2011). When compared to the general UK population, all these diseases are more prevalent amongst ethnic minority groups of which individuals of Black African ethnicity living in the UK are an integral part (Sproston et al 2004; Ogden et al 2007).

More specifically, in the UK, the prevalence of hypertension is three to four times higher in African population than amongst Caucasians (Agyemang et al 2009). Although the reasons for this variation remain unclear, several explanations have been offered, including genetic and environmental factors (Agyemang et al 2009). Similarly, women of Black ethnicity were also reported to be three or more times more likely to be diagnosed with diabetes than women in the general population (Craig and Mindell 2012; Sproston and Mindell 2006). Various factors including increased obesity, unhealthy diets and physical inactivity and insulin resistance have all been linked to the high prevalence of T2D among this population (Oldroyd et al 2005; Ujcic-Voortman, 2009; Jaffiol, 2011; Assah, 2011; Swami, 2009).

It is argued that the increased obesity in the immigrant population is primarily driven by post-migration dietary changes involving increased consumption of energy-dense foods, high in saturated fat, sugar, salt, animal protein and low in carbohydrates and fibre, combined with decreased physical activity, which are characteristic of contemporary Western lifestyles (Gilbert and Khokhar 2008; Steyn and Mchiza 2014). Additionally, genetic predisposition and migration-related stress were also identified as contributory factors to this increase (Gilbert et al 2008; NOO 2011).

In Africa itself, similar trends have been reported with hypertension and diabetes

rising among urban populations (Agyemang 2009; Levitt 2008; Abubakari and Bhopal 2008); indicating interplay of genetic susceptibility and the environment. A comparison of Africans residing in Cameroon, Jamaica and the UK shows that those who migrated to the UK had a higher prevalence of obesity than their counterparts back in Cameroon and Jamaica (Jackson et al 2007). Similarly, overweight and obesity is shown to be on the rise in Africa. Abubakari et al's (2008) review reports that overweight and obesity prevalence in urban West Africa has more than doubled in the past 15 years, with majority of the increase in women (Abubakari et al 2008).

1.7.1 Migration and Factors Affecting Dietary Habits of African Migrants in the UK

Migration to the UK plays a significant role in influencing dietary change (NOO 2011). Subsequent acquisition of a different diet has been linked to striking changes in insulin-like growth factors, especially IGF-1 (Insulin-like hormone produced in the pancreas by humans), which altered (lowered) circulating levels are linked with insulin resistance, impaired glucose tolerance and cardiovascular risk (Oldroyd et al, 2005; Rajpathak et al 2009; Aneke-Nash et al 2015), which, invariably, have been associated with type 2 diabetes and myocardial infarction (Rajpathak et al 2009; Aneke-Nash et al 2015). Migration to the UK also seems to play a significant role in the obesity prevalence in some minority ethnic groups, Africans inclusive (Jackson et al, 2007).

Following migration from a traditional-agricultural environment to more industrialized societies, a shift occurs in the nutritional pattern and lifestyle of migrants. Evidence suggests a combination of part of their traditional diet with some unhealthy components of Western diets (Gilbert and Khokhar 2008) results in adverse effects on weight and health (Luke et al 2001; Agyemang et al 2009). For many migrants, familiar types of food are often unavailable or unaffordable because of the cost associated with import (Lawrence et al 2007; Mintel 2009). It has been reported that maintaining cultural food habits is important to these groups despite high cost; however, low incomes restrict their food choice, often leading to consumption of affordable but poorer quality foods (Gilbert et al 2008;

Holmboe-Ottesen and Wandel 2012). This is because food is a vital part of culture through which cultural identity is often expressed and in many cases, people validate their cultural identities through their eating habits (Holmboe-Ottesen and Wandel 2012; Osei-Kwasi et al 2017). Gilbert and colleagues argue that low income does not always correlate with poor quality diet (Gilbert et al 2008). This is supported by findings by (Vyas et al, 2003) where African Caribbean adults in the UK, despite their low income, spend more money on traditional foods like yam instead of potatoes, hence preserving cultural food preferences (Vyas et al, 2003). A range of other factors has been identified as influencing the dietary habits of minority ethnic groups and these include income, health, food beliefs, religion, time available for shopping and preparation of food (NICE 2006; Mintel 2009, Osei-Kwasi et al, 2017), as well as age in terms of generation, gender, region of origin and occupation (Bhopal 2006). Migrants often find it challenging to maintain their traditional eating habits following migration to a new country as familiar food may be hard to find and more expensive than the equivalents in the host country. Gilbert et al's (2008) systematic review of the changing dietary habits of minority ethnic groups in Europe concluded that most migrants modify their eating habits following migration, incorporating part of their traditional diet with some of the less healthy elements of the Western diet. However, age and generation were identified as two key determining factors adding to the magnitude of the alteration, with the younger generation more likely to consume processed foods than older generation (Gilbert et al 2008).

Understanding the factors affecting the dietary habits of these minority groups and the rationale behind their food choices – the acceptance or disapproval of certain foods can lead to better understanding of their needs, which in turn will aid in designing of health and nutrition interventions that facilitates healthy food choices (Anderson et al 2009; Holmboe-Ottesen and Wandel 2012; Osei-Kwasi et al, 2017).

1.7.2 History of African Diaspora in Scotland

Population movement has varied between the different parts of the UK (Rienzo, 2013) with increasing migration of some ethnic minorities into Scotland (Rutter 2009). West Africans, mainly migrants from Ghana and Nigeria, account for the

largest proportion of those classified as Black African in the UK population (Mitton and Aspinall, 2010; Office for National Statistics 2011). This pattern can also be seen in Northeast Scotland where there has been a more significant increase in certain groups, including African population, namely Nigerians (Aberdeen City Council 2011).

A recent Aberdeen City Council's survey depicts the scale of the flow of migrant workers into Scotland in NE Scotland, Nigerians were ranked as the largest African migrant workers in 2010. The data showed that 44.1% of foreign nationals issued a National Insurance numbers (NINo) in 2009/10 were Nigerians living in Aberdeenshire (Aberdeen City Council 2011). These increases in migration across the Northeast Scotland result from employment for oil industry, education and possibly the Scottish government post-graduate scheme that allowed graduates the opportunity to work in Scotland for 2 years following graduation (NEW SCOTS 2004; Scottish Executive 2011).

The increasing trends and patterns of migration in Scotland have instigated the need to redirect focus on the health behaviours or factors that may influence health outcomes for this growing population; a factor likely to impact health service delivery in the future (Johnson et al, 2006; Jayaweera and McNeil, 2011). To this extent the Scottish Government recognises changes in the composition of its population and advocates the need for service providers to be cognisant of these changes in inclusive service provisions that meet the specific needs of ethnic minorities (Scottish Government, 2011; Bhopal 2012)

1.7.3 Richness and Diversities of Africa

Africa is the second largest continent in the world with a population of 1.1 billion people spread across 54 countries (World Population Review (WPR), 2014). The number of languages, reflecting diversity of people and culture is estimated to be between 1250-2100 (WPR, 2014). African communities have rich unique cultural practices that impact every aspect of life, from customs and rituals performed at harvest time to the foods consumed and their preparation. Given the composition of Africans living in the Northeast of Scotland and the study population, the countries that will be discussed in the context of this study include Nigeria, Ghana,

Cameroon and Zimbabwe.

Nigerians and Ghanaians have similar climates which influence the types of foods grown; these include yam, cassava and cocoa yam which are refined and eaten in different formats as a starchy compliment to soups and stews made with green vegetables such as okra, bitter leaf, 'ugu¹' (green leafy vegetable like spinach) and seeds such as Egusi² or pumpkin seed. Aside from these vegetables, soups are also prepared with both fresh and dried meat, poultry and fish (West, 2004; Bah 2011). Other foods like rice, banku³ (common starchy preparation of maize) (Bah 2011), dokonu⁴ (cornmeal starch) and fufu⁵ made from yam flour, form the core dietary intake (West, 2004; Bah 2011).

Cameroon, a Central African country, has similar foods to Nigeria and Ghana. A typical meal comprises of a starchy main part derived from cassava, yams, rice, coco-yams, plantain, potatoes and grains (e.g. maize and millet). These are served with a soup or vegetable stews, meat or fish and other ingredients cooked in oil (West, 2004; Bah 2011).

Whereas cornmeal is one of the staple foods in Zimbabwe; a typical meal eaten at lunchtime is maize prepared as a thick paste and eaten with soup containing vegetables, beans and meat (Madzima 2013; Ndebele 2014). A thinner preparation flavoured with peanut butter, or dairy products is usually eaten for breakfast. Rice cooked with peanut butter and taken with thick gravy, mixed vegetables and meat is also a local speciality.

In summary, traditional African diets include starchy tubers such as yam and cassava, rice, maize, vegetables and meat or fish eaten with a selection of leafy vegetables.

1.8 Dietary Interventions and Management of Obesity

The management of obesity involves lifestyle intervention, comprising dietary

¹ A green leafy vegetable similar in texture to spinach

² Mellon seeds ground and used in soup as a thickener

³ common starchy preparation of maize

⁴ cornmeal starch

⁵ A form of Cassava farina

intervention, augmented by physical exercise and behavioural therapy (Fock and Khoo 2013). Dietary intervention remains the foundation of weight loss therapy, with many dietary regimens laying emphasis on energy content and macronutrient composition. The energy content is often considered as the determinant of the efficacy of the dietary regimes (Fock and Khoo 2013).

Different dietary interventions can induce weight loss over the short term; however, weight loss maintenance is often a challenge over time and would usually necessitate incorporating continuous exercise and calorie restriction as an ongoing lifestyle to achieve that. Weight management programmes must incorporate assessment and treatment approach with the goal of long-term reduction of weight loss and weight loss maintenance; as the main challenge of obesity treatment is not just losing weight but how the loss of weight can be maintained in the long-term (Montesi et al, 2016).

Obesity treatment should also be geared towards achieving a clinically significant weight reduction, which in-turn lower the risk of adverse health complications associated with obesity (NOO 2011; WHO 2011). A sustained weight loss of between 5% to 10% baseline body weights by individuals with a BMI of 25 to 35, is regarded as a clinical success and capable of reducing the risks of developing obesity comorbidities (WHO 2011; Fock and Khoo 2013). For individuals with higher Body Mass Index BMI, weight reduction of 15% to 20% is generally prescribed (SIGN 2010). However, long term health benefits are dependent on the maintenance of the weight loss and prevention of regain for at least one year (WHO 2011; Fock and Khoo 2013).

The Scottish Intercollegiate Guidelines Network (SIGN) has developed a national clinical guideline for the management of obesity among adults in Scotland (SIGN 2010); however, there is no national weight management strategy. For successful outcome of weight management, the SIGN Management of Obesity clinical guidelines (2010) suggest that strategies that support effective weight loss should incorporate some sort of dietary or lifestyle modification, with or without pharmacotherapy or surgery. For a successful outcome of weight management, the SIGN 2010 recommends that the following components be included in weight management programmes:

- Dietary change. A deficit of circa 600 calories daily for effective weight loss. As the types of macronutrients emphasised in diets do not seem to influence their effectiveness, programmes should, therefore, be “tailored to the dietary preferences of the individual patient”.
- Physical activity. Recommendation of about 225-300 minutes of moderate intensity physical activity per week, or lesser amounts of more vigorous activity.
- Psychological/behavioural therapy. Interventions can include goal- setting, slowing the rate of eating, and stimulus control to enable individuals to avoid triggers that prompt unplanned eating.

Calorie-restriction strategies are some of the most common dietary plans. Low-calorie diet refers to a diet with a total calorie intake of 800–1500, while very low-calorie diets prescribe less than 800 calories daily. These dietary regimes need to be balanced in macronutrients, vitamins, and minerals.

Generally, there are four types of dietary regimens commonly recommended for the treatment of overweight and obesity:

1. Low-calorie diet (LCD)
2. Low-fat diet (LFD)
3. Very low-calorie diet (VLCD)
4. Low carbohydrate high protein diets (LCHODs)

1.8.1 Low-Calorie Diets (LCDs)

LCDs are characterised by high carbohydrate content (55–60%), low fat (less than 30% of energy intake), and high fibre with a low glycaemic index, often with a daily energy value between 800-1,500 kcal/d (Strychar 2006; Fock and Khoo 2013). The glycaemic index, a concept originated to categorize foods comprising carbohydrates, represents the blood glucose response (incremental area under the curve) to a food portion containing 50g of available carbohydrate compared with the response to an equivalent amount of either glucose or white bread (Pawlak 2002). Diets with high fibre contents and low-glycaemic index are associated to increased satiety, lower postprandial glycaemic response and lower insulin levels (Brand-Miller 2003; Pawlak et al 2002; Ludwig 2002). Postprandial Hyperglycaemia (post-meal blood glucose elevation) has been linked to the

increased risk of cardiovascular mortality and diabetes (Brand-Miller 2003; Sigh 2012).

Some of the diets in this category include the National Cholesterol Education Program (NCEP) Step 1 Diet with energy intake restriction (Yu-Poth et al 1999); the DASH diet, based on the US Department of Agriculture Food Guide Pyramid; and some commercial programs (e.g., Weight Watchers) (Freedman, King and Kennedy; 2001).

The effectiveness of low-calorie diets in weight reduction has been debated (Pirozzo, Summerbell and Cameron 2003; Willet and Leibel 2002; Astrup 2001; Bray and Popkin 1998). However, according to a National Institutes of Health (NIH) review assessing the effectiveness of low-calorie diets for lowering body weight, LCD was shown in 34 randomized trials to reduce body weight by 8% over 3-12 months period, as well as lower abdominal fat and improve cardiorespiratory fitness (Strychar 2006).

1.8.2 Low-Fat Diets (LFDs)

Low Fat diets decrease the daily intake of fat to less than 35% of total energy intake, which translates to 30-37g of fat for an individual on a 1500-calorie diet. The popularity of LFDs is based on the belief that dietary fat contributes to obesity; however, this type of diet tends to be compensated with higher carbohydrate intake, which makes weight loss more difficult (Hession et al 2009). A low-fat diet is ineffective in the absence of energy reduction and is unlikely to induce weight loss, as the body will use carbohydrate as source of energy and store it as fat (Hunsberger, Tognon and Lissner, 2014).

Astrup et al (2000), in an analysis of 16 trials, observed that low-fat diets used over 2–12 months achieved mean weight losses of 3.2 kg and improved cardiovascular risk factors. Although weight loss positively correlates with reduction of risk factors for various chronic diseases, low-fat (< 35 % of energy) or very-low-fat (< 20 % of energy) diets can elevate triacylglycerol concentrations, decrease HDL-cholesterol concentrations, and, in some cases, increase plasma glucose concentrations (Astrup et al 2000). As dietary fat is decreased, the dietary

carbohydrate content typically rises and the desired reduction in plasma cholesterol concentrations often occur, but with an elevation of plasma triacylglycerols (Parks and Hellerstein 2000). A moderate-fat diet (25– 35 % of energy), particularly one that is higher in dietary fibre, results in lower triacylglycerol and higher HDL-cholesterol concentrations and, therefore, is not associated with the unfavourable effects mentioned above (Institute of Medicine of the National Academies 2002).

1.8.3 Very Low-Calorie Diets (VLCDs)

VLCDs are diets characterized by a daily calorie intake of between 400 to 800 kcal (Lin et al 2009; Rolland et al, 2009) and there has been an increase in their use due to the steady rise in obesity. Currently, there are many commercially available VLCDs and these diets must be prescribed and administered under the supervision of a health professional in order to monitor severe negative nitrogen balance and electrolyte changes associated with starvation (Dickey et al, 1998). VLCDs are restricted to individuals with a BMI of ≥ 30 kg/m², with obesity comorbidities, who have failed to achieve weight loss through other approaches (Position of the American Dietetic Association 1998). Compared to LCDs with an average weekly weight loss of 0.4-0.4 kg, VLCDs can result in an average weekly weight loss of 1.5-2.5 kg (National Task Force on the Prevention and Treatment of Obesity 1993). This amounts to an average weight loss of circa 20 kg in the duration of 12-16 weeks on VLCDs and only 8 kg on the LCD (National Task force on the Prevention and Treatment of Obesity 1993; National Heart, Lung and Blood Institute 1998). Irrespective of reviews (Rolland et al, 2009; Sellaheewa et al 2017) undoubtedly showing that VLCDs can result in significant weight loss, there are still growing concerns associated with weight regain post intervention as well as the pernicious effects on health because of the rapid weight loss they induce.

Some of the side effects associated with VLCDs include cholelithiasis, loss of lean body mass, ketosis and increased serum acid concentrations due to severe negative energy balance (Dickey et al, 1998). This however needs to be further investigated.

1.8.4 Low Carbohydrate High Protein Diets (LCHODs)

In the recent past, there has been increased popularity in the use of alternatives to low fat diets. One such diet is the high-protein/low-carbohydrate (HPLC) diet (Hession et al 2009). A distinction exists between low carbohydrate diets that induce ketogenesis and those that do not. Low carbohydrate ketogenic diets (LCKD) often consist of between 20 to 50 g of carbohydrate daily. At this level (less than 60 g/d), the body starts mobilising fat stores and using fatty acids and ketone bodies for energy. This result in a metabolic state often referred to as ketosis (Pogozelski et al 2005). Alternatively, low-carbohydrate non-ketogenic diets (LCHOD) often contain over 50g, but less than 200g, of carbohydrate per day (Westman et al 2007). Restriction of carbohydrates in LCHOD and LCKD requires replacement of refined carbohydrates with greater proportions of both fat and protein. Therefore, these diets are often high in fat and/or high in protein with an emphasis on unsaturated fats (Brehm et al 2003).

A novel example of a very high-protein LCKD is the protein sparing modified fast (PSMF), which is defined as an ad libitum low calorie diet (1200 kcal/d) consisting on average of 50% of energy derived from protein, 40% from fat and only 10% from carbohydrate, not over 40g per day (Robertson et al 2002).

Although a low-calorie diet, PSMF focuses on preserving lean body mass by supplying the body with abundant proteins.

With respect to cardiovascular risk factors, several studies reported greater reduction in triacylglycerol levels on the High Protein (HP) diet compared to the Low-Calorie Diet (LCD) after 6 months and 12 months (Foster et al 2003; Stern et al 2004; Yancy et al 2004). An elevation in LDL-cholesterol at three months was also observed by Foster and colleagues (2003) on the LCHOD when compared to the LCD; however, differences were insignificant at one year (Foster et al 2003). Although HPLC diets have been widely hailed as aiding weight loss, complications including vitamin deficiencies, altered cognitive function and increased LDL-cholesterol are associated with it (Denke 2001). The vitamin deficiencies are, however, generally overcome by mineral and multi-vitamin supplementation (Strychar 2006). Replacement of dietary carbohydrate with protein has been shown to improve blood lipid profiles by decreasing triglyceride levels and increasing HDL cholesterol levels (Layman et al 2003); however, some studies

suggest a link between osteoporosis and weight loss (Heaney 1993; Jensen et al 1994; Hegsted 2001). Yet, human (Van Loan et al 1998; Shapses et al 2001; Fogelholm et al 2001; Dawson-Hughes et al 2004) and animal (Roudebush et al 1993) studies present conflicting findings.

Uncertainty remains on the most efficient diet for achieving long term weight loss, with some researchers (Nordmann et al 2006; Hession et al 2009) agreeing there is inadequate proof to either endorse or dissuade the long-term use suggesting that further studies are needed.

1.9 Rationale for Choice of the Two Diets (HPLC and CDD)

Recent reviews have looked at weight loss interventions efficacy and weight maintenance among black women. An evidence-based review conducted by Schlicht and Haglund (2015), aimed to determine if participation of black women in weight loss interventions led to successful weight loss compared with usual care or control groups (Schlicht and Haglund 2015) and to identify weight loss interventions that provided most weight loss success among black women. The review considered randomized controlled trials, systematic reviews, and quasi-experimental studies (Schlicht and Haglund 2015). Out of the four reviews examined, three of them were carried out in the United States of America and focused on black women (Fitzgibbon et al 2012; Tussing-Humphreys et al 2013; Walker and Gordon 2014). The term 'black women' used in three of the four systematic reviews (Fitzgibbon et al 2012; Tussing-Humphreys et al 2013; Walker and Gordon 2014) conducted in the US refers to African American women. One of the systematic reviews was performed in the UK (Osei- Assibey and Boachie 2011); however, no specific details about the participants was given, neither did the review specify the number of studies that included men.

Fitzgibbon et al (2012), Walker and Gordon (2014), conducted systematic reviews that focused on behavioural weight loss interventions trials among black women (Fitzgibbon et al, 2012; Walker and Gordon, 2014); Tussing-Humphreys et al (2013) concentrated on interventions that fostered weight loss and weight loss maintenance in black women (Tussing-Humphreys et al, 2013), whereas Osei-

Assibey and Boachie's review focused on diets and lifestyle interventions that facilitated weight loss and minimised cardiovascular risk in blacks (Osei-Assibey and Boachie 2012).

Fitzgibbon et al (2012) performed the highest quality and most detailed systematic review on weight loss intervention trials covering publications between 1990 and 2010, comprising twenty-five studies that involving black women. Two of the large studies examined, found black women had more robust weight loss than previously described in any other study; however, these black women still lost significantly less weight in comparison with white women and had challenges with weight loss maintenance (Tussing-Humphreys et al 2013). Among 11 studies of black women reviewed, the mean weight loss ranged from 0.5 to 4.6 kg (Fitzgibbon et al 2012). On the other hand, Tussing-Humphreys et al, review that included 17 trials published between 1990 and 2011, found a wider weight loss range of 0.5 to 8.5 kg (Tussing-Humphreys et al 2013). Osei-Assibey and Boachie (2012) examined 18 studies published between 1990 and 2009 and found a mean weight loss of 5.4 kg in 3.5 months, 2.5 kg in 6 months, and 2.9 kg in 12 months (Osei-Assibey and Boachie, 2012). Evidence in the systematic reviews suggest that success in weight loss among black women was often temporarily, and weight gain was a common reoccurrence at the 18-month follow-up milestone (Tussing-Humphreys et al 2013; Walker and Gordon 2014).

Interestingly, Osei-Assibey and Boachie (2012) extensive review on dietary interventions for weight loss and cardiovascular risk reduction in people of African ancestry (Osei-Assibey and Boachie 2012) was the only review conducted in the UK. Nevertheless, all the studies reviewed were performed in the US, further showing dearth of dietary interventions among the African population in the UK. Osei-Assibey and Boachie found mixed messages emerging from the different dietary interventions but concluded that there remains a need for more studies incorporating culturally sensitive elements to explore if greater weight loss can be achieved in this population (Osei-Assibey and Boachie 2012). Table 1.2 shows key characteristics of studies included in Osei-Assibey and Boachie's (2012) review. Among all the studies reviewed by Osei-Assibey and Boachie (2012), only one (Samaha et al, 2003) reported the use of Low Carbohydrates, Low Fat diets.

Table 1. 2 Key characteristics of studies included in Osei-Assibey and Boachie (2012) review on dietary interventions for weight loss and cardiovascular risk reduction in blacks

Study	Mean age (years)	Mean BMI (kg/m ²)	Intervention v. control	Length of Intervention (months)	Dropout rate (%)
Agurs-Collins et al (1997)	61.8	33.9	Weekly sessions on dietary advice and exercise (n 30) v. class session and informational mailings (n 25)	6	14
Anderson-Loftin et al (2005)	57.3	33.1	Low-fat diet advice plus peer group discussions (n 38) v. usual diabetes care class (n 27)	6	23
Becker et al (2005)	47.8	31.5	Lifestyle advice to reduce heart disease (n 196) v. enhanced primary care to reduce heart disease (n 168)	12	27
Racette et al (2001)	47.5	40.0	Diet and activity advice sessions (n 19) v. one diet and activity session (n 17)	12	24
Resnicow et al (2005)	13.8	32.7	High-intensity behavioural group intervention (n 53) v. moderate-intensity behavioural group intervention (n 70)	6	21
Samuel-Hodge et al (2009)	59.0	35.0	Individual counselling plus group sessions (n 96) v. standard educational pamphlets by mail (n 72)	12	16
Yanek et al (2001)	53.1	32.2	Healthy lifestyle sessions plus spiritual components (n 455) v. self-help information (n 74)	12	25
Zemel et al (2005)	41.9	34.5	High dairy/calcium plus energy restriction (n 17) v. low dairy/calcium plus energy restriction (n 12)	12	19

West et al (2007)	53	36.5	Individual motivational interviewing (n 42) v. attention as adjunct to behavioural weight-control programme (n 41)	6	16
Hall et al (2003)	59.9	28.9	Reduction in total fat intake to #20% of energy (n 335) v. pamphlet on general dietary guidelines (n 203)	6	15
Samaha et al (2003)	53.5	42.9	Low-carbohydrate diet (#30 g/d; n 43) v. low-fat diet (#30% of total energy derived from fat; n 36)	6	25
Kennedy et al (2009)	45.9	33.7	Classroom peer nutrition and physical activity lessons (n 18) v. monthly take home lessons (n 19)	6	0
Mayer-Davis et al (2004)	61.1	36.4	Intensive diabetes prevention programme (n 49) v. usual care (one individual session; n 56)	12	21
Ziemer et al (2003)	52.0	33.5	Healthy food meal plan (n 289) v. exchange-based meal plan (n 359)	6	32
Elmer et al (2006)	49.9	33.1	Comprehensive lifestyle modification (n 79) v. advice only (n 100)	6	12
Barnard et al (2006)	55.6	34.9	Low-fat vegan diet (n 22) v. American Diabetes Association guideline (n 22)	5.5	8
Look AHEAD Research Group	58.7	36.4	Lifestyle intervention of group and individual meetings (n 399) v. diabetes support and education (n 404)	12	15
McNabb et al (1997)	56.6	33.5	PATHWAYS weight-loss programme (n 15) v. wait list control group (n 18)	3.5	6

Adapted from Osei-Assibey and Boachie 2012

In the NE Scotland, the standard plan for management of a patient referred to the Specialist Obesity Clinic is to prescribe a dietary treatment beginning with a low-fat, reduced-energy diet (CDD). This is continued if patients respond well to this approach; however, in the event of unsuccessful weight loss with CDD, the individuals are prescribed alternatives diets (in the form of an HPLC) or placed on medication. They are reviewed monthly by the dietician and every three months by the doctor.

Despite the popularity of HPLC diets and evidence pointing to its increasing importance, there seems to be a paucity of its use among the African populations in diaspora, especially those in the UK and the acceptability of such diets has not been tested among this population.

Hession et al's (2009) systematic review of randomized controlled trials of low-carbohydrate vs low-fat/low-calorie diets in the management of obesity and its comorbidities further highlights the dearth of the use of these diets among this population. This systematic review assessed the effects of low carbohydrate diets against low-fat/low-calorie diet covering RCTs conducted between January 2000 to March 2007 (see table 1.3).

Table 1. 3 List of studies and diets included in Hession et al, (2009) review - Adapted from Hession et al 2009.

Study	Description
Brehm et al 2002	RCT comparing a very low carbohydrate diet and a calorie restricted low-fat diet on body weight and cardiovascular risk factors in healthy women.
Brinkworth et al 2004	Comparing long term effects of a high protein, low carbohydrate diet in weight control and cardiovascular risk factors in obese, hyperinsulinemic subjects.
Cardillo et al 2006	The effects of a low-carbohydrate versus low-fat diet on adipocytokines in severely obese adults: 3-year follow-up of a randomized trial.
Dansinger et al 2005	Comparison of the Atkins, Ornish, Weightwatchers, and Zone Diets for weight loss and heart disease risk reduction.
Deu et al 2004	Effects of normal fat diets, either medium or high in protein, on body weight in overweight subjects: a randomized control 1-year trial.
Foster et al 2003	A randomized control trial of a low carbohydrate diet for obesity
Gardner et al 2007	Comparison of the Atkins, Zone, Ornish, and LEARN diets for change in weight and related risk factors among overweight premenopausal women.
Samaha et al 2003	A low carbohydrate diet as compared with a low-fat diet in severe obesity.
Seshadri et al 2004	A randomized study comparing the effects of a low CHO diet and a conventional diet on lipoprotein subfractions and Creactive protein levels in patients with severe obesity.
Stern et al 2004	The effects of a low carbohydrate diet versus conventional weight loss diets in severely obese adults: a 1-year follow-up of a randomized trial.
Truby et al 2006	Randomized controlled trial of four commercial weight loss programs in the UK: initial findings from the BBC diet trials.
Tsai et al 2005	Cost-effectiveness of a low-carbohydrate diet and a standard diet in severe obesity.

In conclusion, Schlicht and Haglund’s (2015) evidence-based review revealed that black women who participated in weight loss interventions achieved modest and short-term weight loss which was invariably not sustained. Bennett et al (2013) also came to similar conclusions that it is difficult for black women to lose weight and maintain weight loss; thus, more emphasis on obesity prevention is warranted. When providing weight loss counselling, primary care providers should consider three essential components: diet, physical activity, and behaviour change. Moreover, before implementing weight loss interventions, it is important to understand patients’ perceptions of obesity and weight loss, barriers to weight loss, and preferences for weight loss interventions.

1.10 Behavioural change in weight management – Theoretical underpinning

There is a quest for increased understanding of behavioural patterns during dietary interventions as well as the process through which new dietary behaviour is acquired (Jeffery et al, 2004). Most theories of health behaviour are believed to provide insight into understanding of and the process of such change in behaviour (Prochaska, DiClemente and Norcross, 1992; Glanz et al, 2008; Doerksen and McAuley, 2015).

Participation in the dietary program, either to promote or maintain weight loss is a complex process and is influenced by many factors. To promote effective healthy nutrition in adult population, better understanding of the determinants of their behaviours is necessary (Doerksen and McAuley, 2014).

Several behavioural theories attempt to explain factors that contribute to embracing new behaviours. One of such theory is the Bandura's Social Cognitive Theory (SCT) (Bandura, 1986 and Bandura, 1997) which has been utilized broadly in predicting health behaviours as well as eliciting behaviour change (Doerksen and McAuley, 2014; Saksvig et al, 2005 and Sallis et al, 1999). The core constructs of SCT which includes self-efficacy, self-regulation, outcome expectations, perceived impediments and facilitators of behaviour (Benight and Bandura, 2004) have been viewed as facilitating understanding of health behaviours as well as dietary intake. Within the core construct, self-efficacy is principal to the process of behaviour change as the belief in one's capability is shown to facilitate the motivation required to achieve a desired behaviour change (Benight and Bandura, 2004). Moreover, self-efficacy is regarded as a key construct because of its influences over other SCT variables (Benight and Bandura, 2004). Individuals with higher efficacy are believed to be more motivated, pragmatic and more likely to set personal goals that enable them to achieve their objectives and bypass barriers to the desired behaviours, than those with low self-efficacy (Benight and Bandura, 2004; Doerksen and McAuley, 2014).

Other most widely used theoretical models in health behaviour are Health Belief Model (HBM), The Transtheoretical Model/Stages of Change (TTM) and Social Ecological Model (NICE, 2006). The HBM originally developed to facilitate understanding of why people did or did not utilize preventative services provided,

posit that people's readiness to act about their health are influenced by their beliefs about their risk's exposure and perceptions of the benefits associated with acting to avoid such risks. The core constructs of HBM includes, Perceived susceptibility and perceived severity, perceived benefits and perceived barriers, cues to action and self-efficacy (added more recently).

The Transtheoretical Model (TTM) known as the Stages of Change Model [Povey et al, 1999; Prochaska, DiClemente and Norcross, 1983), initially developed to clarify addictive behaviours such as tobacco and alcohol overuse (Povey et al, 1999), views behaviour changes as comprising a five-stage continuum where every stage is integrated with distinct activities (processes of change) that facilitates individual's ability to progress to the next stage. TTM posits that individuals move through these stages of change (pre-contemplation, contemplation, preparation, action and maintenance), however, this progression or change in behaviour depicts the person's eagerness to change. The concept of readiness to change, or stage of change, has been investigated in health behaviour research and found helpful in interpretation and prediction of behavioural changes associated with smoking, physical activities and eating habits (Sallis et al, 1999).

The Social Ecological Model (SEM) helps to understand factors affecting behaviour and provides guidance for developing successful programs through social environments. Social ecological models emphasize multiple levels of influence (such as individual, interpersonal, organizational, community and public policy) and the idea that behaviours both shape and are shaped by the social environment. The principles of social ecological models are consistent with social cognitive theory concepts which suggest that creating an environment conducive to change is important to making it easier to adopt healthy behaviours.

Given the growing epidemic of obesity in the United States and other developed countries, more attention is being focused toward examining and improving the health-promoting features of communities and neighbourhoods and reducing the ubiquity of high-calorie, high fat food choices.

It is unclear from literature if behavioural weight loss programs that imbedded theoretical underpinning such as SCT (Bandura,1998, Abraham et al, 2013), HBM (Janz, Champion and Strecher, 2002), TPB (Rhodes and Courneya, 2004) and TTM (Prochaska and DiClemente, 1983) are more successful in inducing weight loss

than those without theoretical basis (Dombrowski, Avenell and Sniehott, 2010). Findings to this regard are mixed and conflicting with Dombrowski, Avenell and Sniehott, 2010 review documenting no evidence of weight loss enhancement while Michie et al, (2009), found an association.

The incorporation of a theoretical framework seems to have no effect on weight loss outcome, either to enhance it or otherwise (Burke et al, 2009). For instance, interventions based on HBM (Svetkey, Erlinger and Vollmer, 2005; Fitzgibbon et al, 2005; Janz and Becker, 1984) and SCT (Bandura, 2002) were not more efficient than those based on behavioral self-management with no particular theoretical framework (e.g. Befort et al, 2008; Kennedy et al, 2009; West et al, 2008). The principal determinant to improved outcome seem to be adoption of behavioral self- management skills that include cutting back on dietary fat and caloric intake, tracking physical activity and routinely attending sessions (Hollis et al, 2008 and West et al, 2008).

This present study was not based on any formal behavioural model as the primary aim of the feasibility study was to assess if the two dietary interventions are acceptable and effective in inducing weight loss in the target population. The study did not set out to affect behavioural change, however, in the light of interpretation of the findings, particularly the post-intervention interviews, references will be made to behavioural models the participants may exhibit and recommendation made for further studies.

1.11 Thesis Outline

Following the first chapter in which the researcher has presented i) a summary of the PhD journey reflecting on the origin of the research idea and personal experience of the researcher as an African woman in diaspora; ii) a brief literature review which includes critical appraisal of the epidemiology of obesity, with a focus on synthesising issues that relate to obesity in African women in diaspora; and iii) a succinct review of previous dietary interventions carried out with the target population in order to establish the rationale for this study, the reader is further taken through what to expect in subsequent chapters of the thesis.

Chapter two will present an overview of research paradigms and methodological

and philosophical underpinnings of this study. This will encompass a comprehensive discussion of the mixed method approach adopted, its appropriateness to the study and the rationale for adopting this method.

Chapter three will discuss the qualitative approach utilising focus group methodology, design of the focus group, aims and objectives, data collection and analysis. The findings and how it was used to progress the next step of the research will be outlined.

Chapter four will discuss the reflexive interview, the aims, objective and outcomes. Validity and transparency will be central in the discussion of the reflexive interviews undertaken.

Chapter five will address the feasibility study, discussing the two diets utilized in the intervention study while detailing the study design, participants' profile, measurements and attrition to determine the effectiveness of the dietary intervention.

Chapter six will present the qualitative semi-structured telephone interview follow-up with participants to determine the acceptability of the administered dietary interventions and the rationale for the choices they made.

Finally, Chapter seven will feature discussion of the key findings from all the three phases of the study and how these fits within the bigger picture. This chapter will conclude by pulling together all the findings, clearly showing the key findings in relation to the overall research aims and objectives. The implications of the study findings for policies, clinical practice, education and future research will be highlighted. It will do this by drawing upon existing literature, policies and philosophies thus, highlighting the significance of this study and the study's contribution to knowledge. Within this chapter, the study limitations will be identified and discussed in detail.

CHAPTER TWO: RESEARCH METHODOLOGY

This chapter will present an overview of the research methodology utilised in this study. It will encompass a comprehensive exploration of the mixed method approach adopted, its appropriateness to the study, and the rationale for adopting mixed methods approach in the dietary intervention development.

2.1. Background of Research Paradigms

A mixed method approach involving methodological triangulation was utilized in this study. Details of the methods used in each phase are included later in following chapters; however, underlying principles of the chosen methodology with reference to the literature are first discussed. To that end, the philosophical underpinning and the definition of the mixed method approach in addition to the definition of triangulation are discussed.

2.1.1. Philosophical Underpinning of Mixed Methods – Paradigm Debate

Mixed methods research has been acknowledged as a third methodological movement over the past two decades, complementing the existing traditions of quantitative and qualitative paradigms (Tashakkori and Teddlie 2003; Teddlie and Tashakkori 2009). This development has been accompanied by a search for an appropriate paradigm to provide a legitimisation for the use of mixed methods comparable to the paradigms that have been widely accepted as justifying the use of quantitative and qualitative methods separately.

The 'paradigm debates' that paved the way for mixed method research have been ongoing for the past four decades. In the so called 'paradigm debates' of the 1970s and 80s, the positivist paradigm of quantitative research was criticised by social scientists supporting qualitative research and proposing constructivism as an alternative paradigm (Reichardt and Rallis 1994). The first wave of ideas characterised by quantitative approaches and methodologies has its roots in the

traditional form of research, often referred to as positivist/post-positivist research. It posits that we cannot be “positive” about claims of knowledge when studying the behaviour and actions of humans (Johnson et al, 2004), rather it believes that knowledge can be observed, tested and is verifiable (Sommer, 2011).

Subsequently, the second wave emerged critiquing the positivist while promoting the significance of subjective human experience and perception (non-numerical philosophical approach). This wave relied on qualitative research and explored epistemology (subjective - what constitutes valid knowledge and how can we obtain it), ontology (relative - What is reality? How do we understand existence?), axiology (ethical - study of value), methodological (dialectic and hermeneutic - how you go about finding out knowledge and carrying out your research) and the rhetorical (use of informality in presentation of concepts and ideas) (Guba and Lincoln 2005). The continual rivalry and battle for recognition and superiority between the two mono-methods within the research community laid the foundation for the emergence of the third wave known as a mixed method approach (Johnson et al 2005; Teddlie and Tashakkori 2009).

In a mixed method design, there are two distinct research parts and each part has its own philosophical framework. The investigator in quantitative research uses post-positivistic claims for developing knowledge, such as cause and effect thinking, reduction to specific variables, hypothesis and questions, use of measurement and observation, and the test of theories (Ivankova 2004). The qualitative research on the other hand, is “an inquiry process of understanding” where the researcher develops a “complex, holistic picture, analyses words, reports detailed views of informants, and conducts the study in a natural setting” (Creswell 1998, p. 15). In this approach, the investigator makes knowledge claims based on the constructivist (Creswell 1998; Lincoln and Guba 1985) or participatory (Mertens 2003) perspectives. In a mixed methods methodology, the researcher builds the knowledge on pragmatic principles (Creswell and Clark, 2017), asserting truth is “what works” (Howe 1988, as cited in Ivankova 2004). The investigator selects procedure chosen approaches, as well as variables and units of analysis, which are most suitable for answering the research questions (Tashakkori and Teddlie 1998). Pragmatism allows for quantitative and qualitative methods to be compatible (Creswell and Clark, 2017).

Basically, the paradigm debate was whether qualitative and quantitative data could be combined. Some argued that mixed methods research was untenable because it demanded that paradigms be combined (Smith 1983). Others challenged this argument and suggested that a clear connection existed between the two traditions (Bryman, 2003). While the debate continues, and some researchers are still cautious of mixed method research because of the perceived incompatibility of "mixing" paradigms, a growing body of researchers, referred to as pragmatists, believe that adopting multiple paradigms can be a better approach to address research problems (Tashakkori and Creswell 2007; Johnson et al 2007).

Pragmatists argue that the 'research question' is the key determinant of the epistemology, ontology and axiology adopted in any research, stressing that one may be more appropriate than the other in answering a specific question. However, when the research question does not suggest categorically that either a positivist or interpretivist philosophy be adopted, then the use of mixed methods, both qualitative and quantitative, becomes possible and appropriate within a study.

Pragmatists are driven to find out 'what works with respect to problems faced by people' and argue that qualitative and quantitative methods are compatible in achieving that goal. In fact, they express that good research designs frequently involve mixed methods. In other words, the decision about whether to use qualitative or quantitative methods (or both) depends on the research question and on the current stage of the research cycle (e.g. using inductive or deductive reasoning).

Although this study clearly adopts a mixed method approach (as will be discussed in detail later in this chapter), it is important to note that in carrying out the qualitative aspect of any study, researchers inadvertently bring to the study their own world views that may end up shaping the direction of their research. Considering this, the researcher, as an African woman in diaspora whose experiences are similar to those of the participants, pre-emptively declares any presuppositions and personal experience capable of biasing this research, by opting to undergo a reflexive interview using the same questions and prompts

from the focus group.

2.1.2. Meaning of and Characteristics of Mixed Methods Research

The term 'mixed methods' commonly refers to the use of two or more methods in a research project, yielding both qualitative and quantitative data (Greene and Caracelli, 2003; Greene 2008; Teddlie and Tashakkori 2009; Creswell and Clark 2017). It is also described as a procedure for collecting, analysing and "mixing" both quantitative and qualitative research and methods in a single study to understand a research problem (Creswell, 2014). "Mixed methods research also denotes adopting a research strategy employing more than one type of research method. The methods may be a mix of qualitative and quantitative methods, a mix of quantitative methods or a mix of qualitative methods. Mixed methods can also be applied to research work involving different types of data or involving different investigators..." (Brannen 2005).

As a research design, mixed method research is associated with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collecting, analysing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone.

Both types of data are often collected concurrently or sequentially with a priority given to one of them. During the process of a mixed methods research, quantitative and qualitative data are integrated at one or more stages of the research (Creswell, 2014).

2.1.3. The Triangulation Design

Triangulation design is the most common and well-known approach to mixing methods (Creswell, 2014). It is a single-phase design whereby researchers employ

quantitative and qualitative methods within the same time frame and with equal weight; a characteristic that earned it “concurrent triangulation design” (Creswell, 2014). Often, researchers attempt to merge the two data

sets, typically by bringing the separate results together in the interpretation or by transforming data to facilitate integrating the two data types during the analysis. The rationale for this design is “to obtain different but complementary data on the same topic” (Creswell, 2014) in order to gain better insight into the research problem. It is also employed with the aim of comparing quantitative statistical results with qualitative findings or to validate or expand quantitative results with qualitative data (Creswell, 2014). The purpose is to elicit valid and well-substantiated conclusions about a single phenomenon. More importantly, this process enhances the validity and reliability of a study and if findings converge, it can also generate new, credible findings about the phenomenon and create new ways of looking at a situation or phenomenon. (Creswell, 2014).

Four basic types of triangulation have been identified by Norman Denzin in 1978 and include: 1) data triangulation: the use of multiple data sources in a single study; 2) investigator triangulation: the use of multiple investigators/researchers to study a phenomenon; 3) theory triangulation: the use of multiple perspectives to interpret the results of a study; and 4) methodological triangulation: the use of multiple methods to conduct a study.

Methodological triangulation will be used in this study and the following sections will explore in more details the concepts and how they have been applied to this study.

2.1.4. Methodological Triangulation

Methodological triangulation, also referred to as mixed-method research in the literature, is defined as the use of two or more research methods in a single study (Tashakkori and Teddlie 2003; Creswell and Clark, 2017). The goal is to minimize biases intrinsic to a single method. In other words, the strengths of one method may augment the limitations of another. In this type of triangulation, results from one method are often used to clarify the result of another.

Two types of methodological triangulation have been identified as ‘across method’

and 'within method' (Brannen 2005; Creswell and Clark, 2017; Teddlie and Tashakkori 2009; Pool et al 2010). 'Across method' combines quantitative and qualitative data collection techniques in the one study (Boyd 2001; Casey and Murphy 2009). 'Within method' triangulation is where more than one method of data collection from the same design is used in a study to measure the same variables (Casey and Murphy 2009).

Methodological triangulation can also be 'sequential' or 'simultaneous' (Creswell and Clark, 2017). This refers to the chronological order used when applying the different methods. In sequential designs, quantitative and qualitative methods are used in phases, with one method used in advance of another method. When qualitative and quantitative approaches are used at the same time, with data from both methods collected simultaneously and the findings from each method are complementary, then this is 'simultaneous or concurrent design' (Creswell, 2013).

Methodological triangulation has been found to be beneficial in providing confirmation of findings, more comprehensive data, increased validity and enhanced understanding of the studied phenomenon (Halcomb and Andrews 2005; Casey and Murphy 2009).

2.2. Mixed Method Sequential Explanatory Design

Three different approaches to mixed methodology have been identified as being concurrent, sequential and conversion (Tashakkori and Teddlie, 2003). However, due to the complex nature of this proposed study, the sequential explanatory design (Creswell 2013) was deemed most suitable to appropriately address the research question and achieve the aims of this study. The mixed-methods sequential explanatory design, as per Creswell (2013), involves two marked phases, with quantitative being followed by qualitative method: the quantitative (numeric) data is collected and analysed first; seconded by the collection and analysis of the qualitative (text) data; to help clarify, or expatiate on, the results obtained from the quantitative first phase (as depicted in figure 2:1).

Mixed-method sequential explanatory design

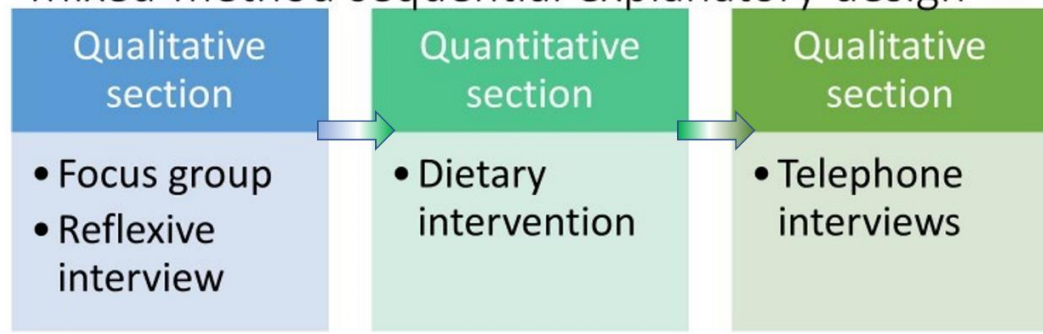


Figure 2. 1 - A diagram summarising the mixed method sequential explanatory design used in this study

The rationale behind this approach lays in the fact that the two types of information gathered from both the quantitative and qualitative data provides greater understanding and insight into the research topic that may have been unobtainable otherwise. While the quantitative data and its analysis provides broad overview of the research problem, the qualitative data and its analysis throw more light on the statistical results obtained from the quantitative data, by in depth explorations of participants' views (Cresswell, 2013). In order words, qualitative data is employed to contextualise the quantitative data (Creswell et al, 2013), complement the findings and aid creation of new knowledge (Taylor and Trumbull, 2005; Mason, 2006).The literature widely discusses the strengths and weaknesses of mixed methods designs (Morse, 1991; Moghaddam, Walker, and Harre, 2003; Ivankova et al, 2006; Creswell, 2013).

The advantages of the sequential explanatory design include:

- The design is straightforward and sequentially proceeds from one stage to another.
- The design is relatively easy to implement for a single researcher because it has separate stages.
- This design is particularly useful to explain unexpected results which could arise from the quantitative phase of the study.

The limitations of this design include:

- As any other mixed methods sequential design, it requires lengthy time to complete.
- The design requires feasibility of resources to collect and analyse both types of data.

2.2.1 Mixed-methods sequential explanatory design and its application to this study

The purpose for this mixed-methods sequential explanatory study was to assess the effectiveness and acceptability of two dietary interventions (HPLC and CDD) among obese African women in diaspora, by obtaining quantitative results from a feasibility dietary intervention study of 33 obese African women living in NE Scotland. This was then followed by purposefully selecting individuals from those that completed the dietary intervention, to explore their experiences in more depth through telephone semi-structured interviews.

Prior to the feasibility dietary program, a focus group was conducted in what was termed stage one of the study. Qualitative data were collected via focus group discussion with 8 women, all African origin living in NE Scotland, and analysed to gain a broad understanding of the research problem being explored. This initial stage aimed primarily to gather information about the best approach for recruitment and follow-up within the population of interest. Participants' dietary preferences, general lifestyle practices, perception of healthy eating, lifestyle practices, health beliefs and attributions that may inadvertently influence individual choice for weight loss intervention were examined. The qualitative data gathered from the focus group partly informed the design of the dietary intervention study and its evaluation, as discussed in detail in Chapter 3.

The second stage involved the feasibility study of two dietary interventions (HPLC and CDD) comprising two phases of data collection. It was at this stage of the study that the mixed-method sequential explanatory design was implored. The goal of the quantitative phase was to assess whether the two diets (HPLC and CDD) prescribed to the participants were effective in inducing weight loss. Quantitative data were collected via an experimental design while the qualitative phase employed the use of semi-structured telephone interview to assess diets acceptability by exploring participants lived experiences with them.

In the quantitative data collection (using experimental design), 33 study participants were randomly assigned to one of the two different diets (n=15 participants to HPLC and n=18 to the CDD dietary groups). Body weight and other anthropometric measurements were taken pre- and post-intervention with the intent of assessing weight changes (details of inclusion/exclusion criteria and

anthropometric measurements of the study participants taken are outlined in Chapter 5). Within the experimental design, other complementary data were collected via food diaries at the 1st, 6th and 11th week, and reflective journals capturing participants' personal thoughts and experiences collected during the dietary intervention.

The second component of the study is a qualitative research approach that allows the researcher explore participant's experiences on and following the dietary intervention. The basis of qualitative research is to elucidate experiences and events (Willig, 2013), with interviews acknowledged as essential data collection technique that provides knowledge of the social world; and how individuals interpret the world around them (Willig, 2008).

Semi-structured interviews using open-ended questions were undertaken to allow ample flexibility, that would not have been obtainable with structured interviews (Willig, 2008, Ogden and Clementi, 2010). The semi-structured interviews were carried out via telephone (rationale for this is detailed in Chapter 6). A purposive sample of 12 participants selected from those that completed the dietary intervention were interviewed to gain insight into their overall weight change experiences. Interviews explored participants' perceptions about acceptability of various aspects of the interventions as well as key facilitators and barriers that may have impacted outcome or adherence. Interview questions were informed by preliminary findings from the focus group discussion, entries from the food diaries and reflective journals collected during the dietary intervention stage as well as from relevant literature (Swanson et al, 2013; Hammarström et al, 2014). Each telephone interview was audiotaped and transcribed verbatim (Creswell, 2013). Analysis of data was conducted using the five-steps of Krueger's (1994) framework (detailed in section 3.3.5 of Chapter 3).

Data from each of the two components were independently collected and analysed separately prior to triangulation. Quantitative and qualitative methods inherently answer different questions, each of which are expected to contribute towards providing answers to the overall research question. By concurrently gathering these data, the researcher also seeks to compare results during the interpretation stage in search of congruent or divergent findings.

As part of the methodological triangulation, the qualitative method (semi-structured interviews) was used post-intervention to gain insight and broaden understanding of the phenomenon under investigation. On the one level of triangulation, the qualitative data derived from the interviews, food dairies and reflective journals add richness to the acceptability and barriers of the two diets, whereas, on the other level, the quantitative data derived from the dietary intervention provide information about the effectiveness of the diets. By applying triangulation and comparing information obtained from both the qualitative and quantitative arms of the study, the richness, importance and applicability of findings will be enhanced. The meaning of findings or interpretation is further increased when results from different sources converge and agree. However, when the findings are not consistent, the researcher may explore further to gain insight into the reasons for the inconsistencies (Weathers et al 2011; Creswell, 2013; Johnson et al 2014).

In summary, triangulation strategy used in this study is evident within the two methods – the quantitative experimental design and a qualitative semi-structured interview. The combination of sources and methods utilised resulted in components that will be triangulated (the weight loss, the outcome from the food dairies and reflective journal entries as well as the interviews). Overall, each component is anticipated to contribute specifically to the understanding of the phenomenon of interest, namely, if the prescribed diets were acceptable and effective in inducing weight loss among the African women population in diaspora. It is also anticipated that triangulating the data collated from two methods will provide rich information on the effectiveness of the intervention and enhance understanding of key factors that support behaviour change and sustenance.

In conclusion, since a single method may not adequately shed light on a phenomenon of assessing the effectiveness and acceptability of the two given diets among obese African women in diaspora; as such, adopting multiple methods as done in this study facilitated deeper understanding of the phenomenon and enhanced the quality of answers subsequently provided. While the quantitative method explained what is observed in a numerical manner, the qualitative data provides an understanding of social situations and interactions as well as participants' beliefs, perceptions, behaviours and reactions.

CHAPTER THREE: FOCUS GROUP

3.1 Aims of the focus group study

The exploratory focus group was carried out with the overall aim to identify the best way to approach participants for a feasibility study of two dietary interventions (HPLC and CDD), as well as exploring beliefs and opinions on healthy dieting, healthy weights and healthy lifestyles in the African women in diaspora in the NE Scotland. More specifically, the focus group, aimed:

1. to gather information about the best approach for recruitment and follow-up within participants;
2. to examine how perceptions of healthy eating and lifestyle practices of study participants impact their ability to maintain a healthy body weight; and
3. to explore with participants their dietary preferences, prevailing lifestyle practices, and health beliefs and characteristics that may advertently influence individual's choice for weight loss intervention.

A diagram depicting an overview of the focus group study is presented in Fig. 3.1

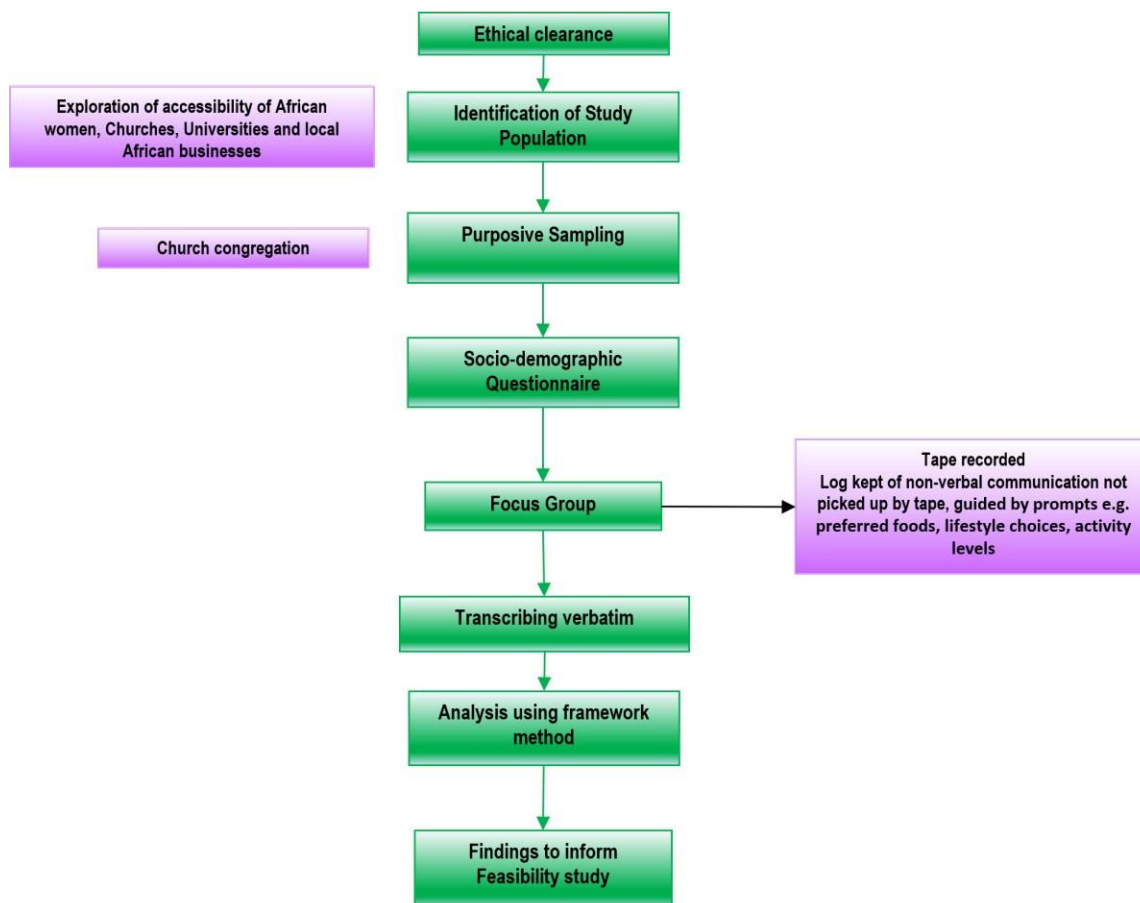


Figure 3. 1 Overview of the focus group study

3.2 Rationale for the Use of Focus Group

Focus groups are widely acceptable and adopted as primary approach to derive new knowledge of and explore what people know and their experiences on a given topic under investigation (Morrison-Beedy et al 2001; Halcomb et al 2007; Krueger and Casey 2009). Focus groups are not only used to explore people’s experiences and opinions on specific subject, but they also provide substantial insight into the reasons behind how and why they think that way (Kitzinger 1995). As a method of group interviews, focus groups originates data through the viewpoints conveyed individually or collectively by participants in a group setting, which would have otherwise remained untapped by more conventional data collection techniques such as one-on-one interviewing (Kitzinger 1995). Increasingly, focus groups are utilized to enable access to groups that are marginalized in predominant cultures that does not encourage involvement in traditional research methods using validated instruments (Clark et al, 2003;

Rodriguez et al, 2011). As a technique of data collection, focus groups remain notably sensitive to cultural variables, demonstrated by how often they are employed in cross cultural research and work with ethnic minorities (Kitchen 2013). Various studies validate the practicality of focus group as a research method in conducting health-related research in culturally and linguistically diverse populations (Huer and Saenz 2003; Whittaker et al 2005; Devlin et al 2006).

Furthermore, the focus groups are recognised as an essential resource in data collection, especially for individuals researching on new topics in an understudied population (O'Neil, 2012; Gideon 2012) as well as those looking to generate ideas and data to help inform a larger scale quantitative study (Halcomb et al 2007; Gideon 2012). Moreover, it serves as a guide in the development of interventions while ensuring that consumers' satisfaction (Morgan 1997; Beyea and Nicoll 2000; Halcomb et al 2007; Gideon 2012). Given that consumers' input reinforces the quality and acceptability of intervention (Peters 1993; Jun et al 1998), focus group methods are a suitable tool in the increasing number of health-related intervention studies being conducted (Kitzinger 1995; Jun et al 1998).

As a research method, the focus groups allow the researcher gain insight into how and why participants think in certain ways (Halcomb et al 2007) through use of open-ended questions that encourages participants direct conversation meaningfully (Kitzinger 1995; Halcomb et al 2007). The group process further aid participants make clear their views in ways not achievable through one-on- one interviews (Halcomb et al 2007).

Although broadly used with Western populations, focus group techniques can be used in engaging culturally and linguistically diverse populations (Halcomb et al 2007). For instance, Lawrence et al (2007) utilised focus groups to investigate factors that affect the food choices made by girls and young women from minority ethnic groups, living in the UK. Similarly, Tiedje et al, 2014 employed focus group to explore healthy eating knowledge, practices and barriers that influence food choices of immigrants and refugees in United States.

Notwithstanding the various advantages associated with focus groups, there is still need for rigor in its application (Pearson and Vossler, 2016, Nyumba eta al, 2018). Critics argue that focus group as a technique is too superficial and incapable of uncovering deeper phenomenon associated with individual experiences more likely

to be disclosed in one to one interview instead (Hopkins 2007; Kruger and Casey 2014, Leung and Savithiri, 2009). It has also been critiqued as violating ethical principle of confidentiality because of the presence of other research participants, which might lead to dishonest disclosures (Hopkins 2007; Kruger and Casey 2014; Leung and Savithiri, 2009). Moreover, it is argued that more dominant participants may control discussions above those who are introvert in nature (Hollander 2004; Kruger and Casey 2014).

While some measures are put in place to address some of the obvious limitations of focus groups, there are cases where the use of a focus group as a data collection tool is inappropriate. For instance, focus groups are not appropriate in situations where researchers worry about people influencing each other, when they need to generalize results to a large population, or when statistical data is required (Loviglio 2012). More so, there still exists a lack of consensus on whether focus group is appropriate for conducting research about sensitive situations or emotive topics. While some researchers support the use of one-to one interviews instead, due to its confidentiality and absence of perceived pressure from peers (Jordan et al, 2007) , others argued focus group could be used in such situations but require mutual agreement by participants, sensitivity and increased awareness on the part of the researchers, recognising possible impacts of such process of data gathering upon the researcher's and research participants' feelings and lives (Oliveira, 2011).

3.2.1 Challenges to Recruit Participants from Ethnic Minorities

Since recruiting participants from ethnic minorities in medical research has proved to be particularly challenging (UyBico et al 2007; Robinson et al 2007; Huang and Coker 2010), with several studies reporting lack of participation among African Americans (Armstrong et al 1999; Gillis et al 2001; Warren- Findlow et al 2003; UyBico et al 2007), it was necessary to assess or determine participants' recruitment strategies to be used in the following feasibility study by using focus groups to ascertain the target population's preferences in the way they are approached to participate in research.

Findings from research studies suggest institutional contacts as one of the most plausible means to access minority ethnic groups (Mclean and Campbell 2003;

Campbell et al 2007. Church recruitment and interaction with community organisations and leaders were cited as the most commonly means of recruitment for intervention among minority populations (UyBico et al 2007; Chatters et al 2009). Therefore, to maximize the prospect of accessing and recruiting from this population, the approach to go through churches due to the importance of worship amongst Africans (Chatters et al 2009) was employed.

3.3 Methods

3.3.1 Recruitment

The purposive sampling technique was deemed the most suitable one for recruiting participants for the focus group and for ensuring choice of informants willing and able to provide information by their ethnic knowledge and experience (Tongco 2007, Suri 2011; Ritchie et al, 2013). It is a non-random technique that does not require underlying theories or a set number of informants (Tongco 2007, Suri 2011; Ritchie et al, 2013). The researcher determines what needs to be known and proceed to locate individuals with the appropriate knowledge or experience and willing to provide the needed information, as a result of their knowledge or experience (Lewis and Sheppard 2006, Ritchie et al, 2013; Palinkas et al, 2015). Purposive sampling is demonstrated through the key informant technique (Bernard 2002; Jarvis et al 2004; Lyon and Hardesty 2005), whereby selected individuals are implored to serve as guides to a culture. Key informants are observant, reflective members of the community of interest who are knowledgeable about the culture and are happy to share their knowledge (Tongco 2007, Suri 2011; Ritchie et al, 2013).

African women were contacted through announcements of the study by the Minister of a Church where most worshippers were Africans. Participants were later recruited purposively by visiting the church for a second time. A brief description of the study was given to the women in attendance by the researcher before distributing flyers (See Appendix A) and the information leaflet (See Appendix C), with an attached reply slip, detailing the nature of the study. Women interested in participating in the focus groups were encouraged to reply either by phone, email or returning the reply slips directly to the Principal Investigator.

Interested participants were later contacted to ascertain their availability and preferred dates and times for the focus group. Based on their indicated availability, the focus group was arranged. Information sheets were subsequently given to the prospective participants with a copy of the consent form (See Appendices C and D), which they were advised to bring with them on the day of the focus group. A follow-up telephone call and/or confirmation email was sent out to all participants two days prior to the focus group as a reminder.

3.3.2 Inclusion Criteria

The following criteria had to be met by the participants to be included in the study:

1. Identify as an African woman residing in the Northeast of Scotland
2. Aged ≥ 18 and fluent in English
3. Have a BMI $\geq 30\text{kg/m}^2$ or $\geq 28\text{kg/m}^2$ with known co-morbidities or just expressed an interest in healthy eating even if not obese.

3.3.3 Focus Group Settings and Topic Guide

On arrival to the venue, participants were asked to complete a short form with their social demographic information (see Appendix D) prior to commencing the focus group discussion. The focus group discussion was conducted in a spacious room at Robert Gordon University, NE Scotland and lasted for approximately one hour. The open-ended discussion guide was developed based on literature (Weathers et al 2011; Swanson et al 2013; Tiedje et al 2014) to elicit a wide range of information on participants' health beliefs, dietary preferences and general lifestyle practices, factors that may influence individual decision to embark on dietary intervention and preference for follow up, if they decide to take part in a dietary intervention.

A discussion guide for the focus group (Figure 3.2), which was developed based on the aims and objectives of the study and review of the literature, covered a range of topics with questions seeking to uncover: a) participants' perception of a healthy diet/healthy weight; b) perceived benefits and barriers to healthy eating;

c) dietary preferences and eating patterns in home country and in the UK; d) dietary choices and decision making in the home; and e) preferences for intervention and mode of follow-up if participants decided to take part in a prescribed dietary intervention.

A total of 9 open ended questions were asked in sequence, moving from a generic topic to a more specific area of interest (see table 3.1). The rationale for this arrangement was to allow for seamless discussions.

Probes were discretely utilized by the facilitator to elicit more information and facilitate further discussion of the subject area where necessary. For example, when participants were asked the first question, "what healthy eating and weight means to you?", Participant three (P3) responded, "Doing things and eating things that are not detrimental to our health." Probes such as, "tell me more what you mean by things not detrimental to our health..." were utilized to elicit further explanation from participants, as well as obtain alternative views of other participants where applicable.

Table 3. 1 Focus group interview guide/prompts

1. What does healthy eating and healthy weight mean to you?
2. In comparison to the food you eat in your home country, do you consider yourself eating a lot healthier since you moved to Aberdeen?
3. What do you perceive as the major benefits of and barriers to healthy eating since your arrival in Aberdeen? Or what are the things that make it easier or more difficult for you to have a healthy diet? (During the discussion, prompts were split into two categories – benefits and barriers to healthy eating).
4. Many people have favourite foods that they would not give up, no matter what. Sometimes these foods are special because you grew up eating them or because they are a part of your culture. What foods that you eat fall into this category? How often do you eat them in a typical week?
5. As a family, how often do you eat together? Who decides the diet in your family?
6. If you would want to make some changes to your or family's diets, what would those changes be? What do you think would make such changes difficult and what would enable you to effect such changes?
7. What does physical activity mean to you and how do you feel about using physical activity (exercise) as a means of managing your weight?
8. What factors could influence your decision to embark on dietary interventions?
9. If you decide to take part in any dietary intervention, how would you prefer your progress monitored?

The focus group discussions were digitally recorded with permission from the participants. An assistant was present and kept a log of interactions and captured body language and non-verbal communication. The audio recording of the interaction was subsequently transcribed verbatim for analysis.

3.3.4 Ethical Considerations

Prior to commencing the focus group, ethical approval for this study was sought and obtained from the School of Pharmacy and Life Sciences Ethics Committee of the Robert Gordon University. Information sheets (see Appendix C) were provided

to participants with detailed explanation of the study, voluntary participation, withdrawal, and maintenance of confidentiality. Written consent was obtained from each participant and they were asked to complete a short form with their social demographic information prior to commencing the focus group discussion (see Appendix D).

3.3.5 Data Analysis

The analysis of the data collected was carried out following the five-steps of Krueger's (1994) framework. Familiarization with the data was achieved by reading the transcripts several times to become immersed in the data to assimilate the discussion prior to breaking it into parts. Manual coding was guided by line-by-line analysis that result in memos written in the margin of the text in the format of brief phrases. Emerging themes emerging from the text were later adopted as the basis for generating categories. The descriptive statements formed were indexed by highlighting and sorting quotes and making comparisons both within and between cases. Key themes were then identified by charting and grouping similar quotes together from their original context. These concepts were subsequently grouped into categories based on their resemblance in content or emotive tone and further reviewed for the likelihood of subcategories. The final step involved mapping and interpretation through making sense of the individual quotes and relationships between all quotes and links between the data. Selected quotes from the focus group transcripts were used to illustrate and provide insight into the themes and categories that emerged from the analysis.

To ensure the rigor and-robustness of data analysis, a member of the supervisory team independently co-analysed the data using the same framework and method. The content from both analyses were combined and compared to reach agreement on identified categories and sub-categories descriptive names to facilitate interpretation. To ensure authenticity, member checking, known as participant validation – a process for exploring credibility and validity of results, (Creswell, 2014, Birt, Scott and Cavers, 2016) was employed by returning emerging categories and themes to participants to check for accuracy and resonance with their views.

3.4 Results

3.4.1 Participants' Demographics

The participants were aged 18-40 years, all identified as women of African origin from Nigeria, West Africa. The entire group was homogeneous with respect to tribal background as seven of the eight participants were of the Ibo tribe in the Eastern part of Nigeria. Only one participant was from a different tribe (Ikwerre). Seven out of the eight women were married (ages 25-40); six in full-time employment (ages 25-40); one in part time employment and one a full-time student (aged 18-25).

All participants had tertiary qualifications (1st degree or higher), except one participant who recently finished her advanced Highers qualification (equivalent to A' Level qualification in England) and was waiting to start her first-degree program (Participants' characteristics are presented in Table 3.2).

Table 3. 2 Participants' characteristics

Participant	Age	Origin/Tribe	Marital Status	Employment Status	Highest Education
1	25-40	Ibo	Married	Part time employment	Masters (PhD student)
2	25-40	Ibo	Married	Full time employment	Masters
3	25-40	Ibo	Married	Full time employment	Bachelors
4	25-40	Ibo	Married	Full time employment	Masters
5	25-40	Ikwerre/Rivers	Married	Full time employment	Bachelors
6	25-40	Ibo	Married	Full time employment	Bachelors
7	25-40	Ibo	Married	Full time employment	Bachelors
8	18-25	Ibo	Single	Full time student	Highers

3.4.2 Focus Group Findings

This section will present the six key themes elucidated from the participants' focus group discussion in stage one. Each theme will be supported with a discussion of its ingrained sub-themes. This will be followed by a brief introduction identifying the theme and then a topic sentence for clarification, followed by quotes to illustrate the theme. Codes were adopted in place of names in this session of the thesis, as well as the entire thesis, to maintain confidentiality.

Six major themes emerged from the focus group discussion. This process was guided both by the research objectives, as well as new concepts created inductively from the data. Recurring themes that emerged were: (1) healthy eating and lifestyle, (2) dietary preferences (healthier foods in home countries compared to NE Scotland), (3) eating practices (family's influence in meal choices and times of eating), (4) barriers and challenges to healthy eating and lifestyle, (5) facilitators and motivators for lifestyle changes, and (6) recruitment strategy

and follow up preferences for future studies.

Theme 1: Healthy Eating and Lifestyle

Under this theme, participants described healthy eating and lifestyle as linked to eating the right dietary and food combinations while maintaining a healthy weight. They also described a balanced diet as consuming meals that included various classes of food in the right proportions:

'...healthy eating is having a balance diet...make sure you have got all the classes of food in the right proportions in the meals you've got' (P1)

In line with this, participants also considered consumption of fruits and vegetables as an important component of healthy eating. However, they reiterated the importance of portion control and the need to incorporate other classes of food in the daily food consumption in maintaining a healthy lifestyle:

'...you should eat five fruits and five vegetables a day' (P5)

'... fruits and veggies are very wonderful, but we shouldn't leave out the other classes of food; as for me, that's what constitutes healthy eating. We should try to make sure we eat every class of food and the right proportions are present in the meal you are having' (P1)

Participants linked healthy lifestyle and healthy weight to preservation of health. They further demonstrated knowledge of the benefits of healthy food and the destructive effect of unhealthy food to well-being:

'Healthy eating and healthy weight is doing things and eating things that are not detrimental to our health, things that don't harm us, things that wouldn't cause a risk to our body. I mean making us gain weight or eating things that would make us ill' (P3)

There was also consensus of the benefits of healthy eating, which were enumerated by the participants to include both medical and social well-being:

'... Having more energy' (P4)

'... you will be able to run after your kids' (P4)

'... you feel much lighter. I feel you feel much lighter, healthier' (P6)

'... When you eat well, you have enough strength as P4 said. And eem, you are up and doing and you are happier as well' (P6)

In addition, participants noted that exercise was crucial in maintaining healthy lifestyle and cited range of exercises to be undertaken:

'... make sure that in a day you do some exercises, like walking.... You can go to the gym, go out and jog around or in your house you can have your exercises.'
(P5)

One participant, however, cautions about the adverse effect of exercise on the medically unfit:

'... as much as exercise is important for everyone to actually observe, you also put into consideration, the different categories of people because there are certain exercises that certain categories of people are advised medically not to do.' (P1)

Theme 2 - Dietary Preferences - Healthier food in home countries compared to NE Scotland

All participants except one held the opinion that they had a healthier diet in their country of origin, Nigeria. They pointed out the smaller pool of available African foods in their area in NE Scotland and the higher costs of these foods. The food 'back home' was more organic, less expensive, fresh and easily available with a wide variety to choose from, as opposed to the perceived poorer quality of African vegetables imported into the UK, which were typically dried. However, one participant said there was no change in her circumstance either way:

'...I ate healthier food back home.' (P6)

'When I was in Nigeria, I had healthier food than here.... In my village, there are special foods you can find there that are not here.' (P7)

'I will say in Nigeria, I had more access to fresh fruits and vegetables... we were brought up eating a lot of vegetables and I think there were tastier than what we have in the shop here today.' (P2)

'For me, I think I ate a lot better when I was in Nigeria, a lot healthier when I was in Nigeria than here. Because since I came to There are so many things I haven't been able to eat, and I had always stuck to Indomie⁶ and the rest of them.' (P8)

Participants referred to some foods obtained in their country of origin as being 'medicinal,' which kept them from having frequent colds. They expressed frustration when comparing the quality of vegetables obtained in their home country, which were said to be fresher and had higher vitamin content than their less well-preserved dried equivalents imported to the UK:

'Some of our foods back home are medicinal, like some of the leaves we use in making our soups... There is no way my mum will cook without them, because we eat some of these things, we hardly catch cold but to find them here is hard and if you do find them, it's all dried up and I believe most of the vitamins are gone.' (P2)

'... fresh veg back home...were leafier. We even used fresh vegetables on daily basis...' (P6)

Participants noted their preference for food eaten in their home country, linking certain diseases to consumption of western diets:

'If you compare the kind of diseases we suffer here and those ones in Africa, you can actually tell that our diet is a lot better than what they've got here' (P4)

'There are many illnesses we hear about here which we haven't heard about before, so I want to relate it to diets, our own diets as well' (P3).

One participant indicated she ate a lot healthier in the UK compared to when she was back in her home country. Integration with local people helped to discover

⁶ A form of noodles

other non-African foods that they enjoy (minority view):

'generally, I will say, I eat healthier here than back home, because, my reason is that, like here, I have some of my friends who are whites, when they come into my house, they taught me how to cook their soup, some of their things, so I will say that I eat healthier here than back home.' (P5).

Theme 3: Eating practices - family's influence in meal choices and times of eating

There were different descriptions of family eating practices, ranging from the members of the family eating together to not eating together and the reasons for the constraints.

'... Well obviously, we don't eat together all the time, sometimes I feel like eating but sometimes he himself (husband) will feel like eating, so we don't eat together all the time.' (P7)

'I think my husband was brought up to think that he must have to swallow once a day... So, when he is eating that, I will be eating rice. ... even though we eat together, he is eating something else because I can't eat what he is eating.' (P2)

'I try to make sure he and my son eats together because my son wants to do anything daddy is doing.... I just make sure they eat together if it is possible, while my son is having his own option, daddy too is just having his meal and then, for me, it's whenever and whatever I want to eat I eat; it mustn't be tied to their own food or eating pattern.' (P1)

'I will say that we eat once in a family in a day, in a week, once a week because the days of his shifts and my own schedule as well, so we don't stay at home, so he is working at night while I'm working day, so, we don't stay at home all the time except on weekends, that's when we can eat together.' (P5)

'I can't recall eating together with my father, my mum and my sisters, because their times schedules won't allow us do that. Sometimes my mum will go to work at 5am, 6am in the morning and comes back very late when

we are almost in bed. So, she's not at home and my dad is always off and on, he's not at home, most times, we eat on our own.' (P8).

Participants also highlighted the role significant others in the family play in making meal choices and times of eating, which presented an interesting mix as seen in the comments:

'...in my house, we've got different opinions.... me I can eat rice every day, three times in a day.' (P3)

'Yes they (husband and children) are in charge; I always ask them what they want to eat. But I always got the soup ready for them.' (P6)

'So, I make the decision, I cook what everybody eats, if you don't want it... You can't even cook what you like, so eat what you are given, that's it.' (P4)

'I don't decide what they eat; they decide for themselves what they want to eat..... everybody has his own opinion on what he wants to eat.' (P5)

'... everybody has their own decision and they eat what they want to eat.'
(P8)

Almost all participants listed the types of food they usually ate at home and the frequency they are eaten in a typical week. The main foods consumed included carbohydrate-based foods, such as rice, garri⁷ (a cassava-based food), bread, and pounded yam⁸ (made from yam flour):

'Rice, rice and plantain I will say in the average I eat rice 3 times a week.' (P2)

'I will say bread daily.' (P4)

'Eba, garri and draw soup My kids must eat garri and draw soup, at least once or twice in a day.... I don't know but we must eat garri and draw soup

⁷ A cassava-based food, largely carbohydrate in content and widely consumed in Africa.

⁸ Yam farina

(sauce made with Okra vegetable, popularly known as ladies' fingers) every day.' (P7).

'The most common food in my house is rice, followed by noodles, and then the third on the list will be Eba (Nigerian staple food made from dried grated cassava (Manioc) flour, commonly known as garri) and soup (varieties of sauces uses for eating garri/eba). And rice is maybe four times in a week and then, Eba and soup for my mum and dad is every day too.' (P8)

'Let me say four or five days in a week, I must eat rice....' (P5).

'Rice, because it's quick to eat rice; potatoes, I just try to make a mix, sometimes rice, sometimes potato, sometimes pounded yam, it all depends, and baked beans or our normal, local, African beans. So, we are not particular about this is favourite or not, if it's a healthy option, it's ok.' (P1)

'In my house, we've got different opinions; me I can eat rice every day, three times in a day and then my son, cereal, he can eat cereal morning, afternoon and night unless you force him to take anything different.' (P3).

Theme 4: Barriers and Challenges to Healthy Eating and Lifestyle

Various factors were perceived by participants as barriers to healthy eating; these ranged from personal (such as cravings), to environmental, societal and cultural obstacles, such as easy access to junk food and non-availability of known foods. Other barriers identified included structural obstacles, such as finance, cost and time constraints.

Taste and cravings were echoed as a major barrier to healthy eating and a key behaviour motivator. Craving for unhealthy food was mentioned by one participant as a major cause for not adhering to healthy food:

'Once I start craving for something, if I don't have it, it's like I'm falling sick, so, not until I go to take that thing, I wouldn't actually feel okay. So, that's just it.' (P1)

'... They (some people) know that eating these things will make them gain more weight but they are just adamant, they don't care, they want to, they crave to have it, so it will be a barrier for them to eat healthy.' (P3).

Craving for certain ethnic foods was also mentioned as a barrier to the extent that one participant was asking for help to break free:

'In fact, there is a problem, it's a burden to me, I don't know if you will be able to help me on that. This thing about garri, not to eat the garri but to chew it, raw, raw; you know that side that looks like sand...' (P5)

'At the moment that's what I crave for, I avoid going to the kitchen.... it was so bad as in when I go somewhere to see somebody, the first thing I do is go into your kitchen and ask you, 'please can I have garri?' (P1)

Another barrier highlighted was taste. Participants acknowledged that certain foods, such as green vegetables, were healthy; however, they avoided eating them as their taste was not appealing:

'I think the question for me will be taste All these green foods, lentils and stuff; I know they are good for me, but they taste yucky, so, I won't eat it.' (P4)

Participants also identified easy access to unhealthy, ready-made meals and the unavailability of healthy African food as major barrier to healthy eating:

'Sometimes we want to go for ready meals; maybe you just pop it into the microwave some of those ready meals are not actually the healthy options you know, so, yeah, I think if it's just what is readily available to you at the time... It's just that what we get over here, we don't have easy access to organic meals in terms of fruits and vegs. We don't have easy access to what we call organic, like in Nigeria we know most of the produce are organic.' (P1)

'I'm usually telling myself, 'you are not eating what you are meant to eat but I can't help it because that what I'm seeing all around me.' (P8)

The high cost of healthy foods also emerged as a key barrier to healthy eating. A sense of frustration was aired by the participants who desired to eat healthy, but could not afford it due to cost:

'The second one will be cost, there are some things I like, like salmon but I can't eat it every week because it's very expensive.' (P4)

'It's very expensive. So, finance can make you not to eat healthy.' (P3)

'.... but when I was in Nigeria, it's like every week, you could eat it, you could afford it, you could get it; eem I couldn't find so many things, so many things I could eat in Nigeria I couldn't, I have not been able to find them and whenever we find them, it's quite expensive.' (P8)

Another major structural barrier identified as inhibiting healthy eating was constraint on time to prepare healthy home-made meals from scratch.

Participants noted that preparing traditional healthy meals takes time, and due to other competing demands, such as family and jobs, they are unable to do so regularly:

'I think the time involved in making some kinds of food also matters. For instance, you want to make a bitter leaf soup⁹ and you want to do it from the fresh, you want to do it from the scratch, the time involved in washing the veggies will take time and you wouldn't want to do that all the time. You might want to do that once in a long while.' (P1)

'The time involved in making some kinds of food also matters.' (P6)
'Sometimes you struggle with time especially if you've got family.' (P1)

Theme 5: Facilitators/Motivators for Lifestyle Changes

Consistently, participants mentioned 'health,' 'appearance,' 'energy level,' 'public opinions' and 'family pressure' as major motivational factors that will influence their decision to embark on lifestyle changes involving dietary intervention:

'I think what made it easier for me was when I went to see the medic and he said, 'your blood pressure is higher than average,' that was a clear call for me.' (P4)

⁹ A vegetable soup made from bitter herbs, palm oil, fish, meats and other native spices.

'I didn't need anybody else to tell me to cut out salt, a lot of salt from the food and try and eat healthier and try and start going to the gym... It was a big shock, yeah!' (P4)

'I think for me, it will be public opinion because between my wedding and now (which is less than 12 months), I think I've added two dress sizes, and everybody seem to be complaining and I don't feel comfortable anymore.... So, basically, it should be public opinion and of course what my family thinks about me.' (P2)

'Because when you look good, you feel good in yourself and it will interpret how other people see you.' (P4)

One participant noted that healthy eating protects from sickness and mortality. So, the fear of the above was a catalyst to embarking on a healthy lifestyle as expressed by this participant:

'You are scared of dying; you are scared of being on a sick bed; so, you cut down in some things.' (P3).

Theme 6: Recruitment Strategy and Follow Up Preference for Future Studies

All participants expressed their preference for online for example, email and telephone follow up instead of face to face meetings, apart from one participant who prefers face to face meeting:

'... I prefer face to face, internet is really deceiving us; so, I want to see you.'(P3)

Both time constraints, family and work commitments were listed as factors influencing decisions to opt for online method:

'Maybe the face to face could be occasionally, at least you will see those that would want to be seen but for me, internet use is readily accessible and available, so...' (P1)

'I would have loved face to face but the issue of time, family as well. Having to come here without your children; so, I will go for email, when I'm able

to come face to face I'll let you know in advance that I will be available for...'
(P6)

'If it's face to face, it will really be a hard work you know, considering time, you are always busy, we are always you know, you go to work, come back, take care of your kids, so, but I prefer online you know, as in the internet'
(P7).

3.5 Discussion

The findings of this focus group are novel and the first to qualitatively explore dietary preferences, lifestyle practices, health beliefs and other factors that may influence dietary choices for weight loss intervention among African women living in NE Scotland.

The findings from this focus group provide insight into how this significant, but understudied, population views healthy eating and the meaning they give to this concept. Participants displayed knowledge of what healthy eating and lifestyle were, and the negative impacts of unhealthy eating. However, a further exploration of their account of eating habits revealed an inconsistent behaviour that inhibits translation of such knowledge into lifestyle choices. For example, when participants were asked what their favourite foods were and the frequency, such food is consumed in a typical week, the list included mainly carbohydrate-based foods such as rice, bread, pounded yam¹⁰ and garri¹¹, referred to as 'eba' with little or no fruits and vegetables. This finding is congruent with other studies that examined food attitudes and eating behaviour amongst different ethnic groups, which affirms that knowledge of nutrition and food risks does not necessarily translate into healthy eating behaviour (Untaru 2013; Acheampong and Haldeman 2013; Swanson et al 2013). It further shows that substantial knowledge of what is healthy and nutritional alone is not pivotal motivation for food choice. It is important, as the findings of this focus group indicate, to take into consideration other factors such as taste, texture, appearance and smell as these were powerful enforcers of food choices. In other words, food perceived as

¹⁰ Mashed yam paste

¹¹ Cassava farina

healthy, such as green vegetables, may be disliked because of their appearance and taste while unhealthy foods may be desired for the very same reasons.

Moreover, the preference for African staple foods such as garri, and pounded yam among this target population poses a huge barrier to healthy eating. Although these staple foods are not necessarily unhealthy in themselves, the frequency and quantity at which this class of food are consumed in a typical week and its classification as a healthy option is inconsistent with the ethos of healthy eating; such as eating the right proportion of wide range of food from each food group, in order to achieve a healthy, balanced diet (Choices NHS, 2013; Buttriss, 2016).

Findings from this focus group highlighted incongruities between knowledge of what represents healthy food and food practice. While participants had greater awareness of vegetables as part of healthier options, there was an indication that in practice, they tended to consume little or none. A probable explanation for this disparity may be connected to the structural barriers to healthy eating, such as lack of availability, high cost of vegetables and traditional African foods as a result of most of them being imported; time constraints due to competing demands as highlighted in this study and in support of findings from previous studies (Delisle 2010; Swanson et al 2013). These barriers to healthy eating, however, is not unique to African women but has also been reported in several other studies involving dissimilar population, settings and cultures (Seguin et al, 2014; Mc Morrow et al, 2016 and Munt et al, 2017). However, this finding suggests that there are complex lifestyle factors influencing the eating behaviour of this population.

The findings further support reports from previous literature that suggests the association between acculturation and dietary change is complex and can be affected by food environments and sociocultural factors, such as family dynamics, which establishes food preferences and dietary patterns that inadvertently influence dietary change (Lawrence et al 2007; Tiedje et al 2014).

Contrary to a viewpoint commonly portrayed in the literature that African women are more comfortable with their weight and accepting of larger body sizes (Grabe and Hyde 2006; Bretkopf et al 2007), the African women in this focus group were unanimously discontented with being overweight/obese. Although cultural tolerance of obesity has been attributed to the African population, the findings from this study suggests that this culture might be changing as indicated by the

presence of strong positive social pressure, such as incessant reminder by significant others on the need to lose weight. Similar results of general dissatisfaction with body image among obese West African women (Duda et al 2007; Nenkeser, Biritwum and Hill 2012) have also been documented. One aspect of the findings from this study, which has not been previously reported, is the indication of increased pressure on the African women to lose weight from colleagues, friends and more importantly, from close family members.

There is also an indication for a growing concern that the next generation of Africans in NE Scotland might struggle with food identity crises as some of the participants' narratives suggest their children are consuming too much energy-dense western foods and sweetened beverages, such as cereals, sugary juices and high-fatty unhealthy foods. In some cases, they reported that their children consumed this sort of food and drink at every mealtime. As highlighted in this focus group, awareness and knowledge of healthy eating and lifestyle do not translate to appropriate behaviour. Providing support to African women to lose weight and adopt healthy lifestyles will require multifaceted approaches that combine education, behaviour therapy and ongoing support.

Importantly, the focus group study highlighted recruitment considerations which were essential to consider when targeting candidates from this population into the feasibility study, hence justifying the key rationale for conducting a focus group in the first place. The participants' preference to be followed up remotely by email and/or telephone instead of face-to-face meeting, if they decided to participate in a dietary intervention, was instrumental to the refinement of the feasibility study protocol from bi-weekly face to face follow-up to bi-weekly emails and/or phone calls. Participants' preferences, as highlighted by this study, may contribute to understanding how to overcome the barriers associated with recruiting and retention of individuals from ethnic minority groups in a research study. The information gathered in the course of exploring the best avenue for recruitment informed the idea to confidently approach Churches for this stage of the study, and subsequently including Universities and various African Community Group Meetings as avenue for recruiting participants for the feasibility study. This finding is also congruent with other suggested approaches for recruiting through partnerships with churches and community leaders among others, as identified by previous studies (Swanson and Ward 1995; Campbell et al 2007; UyBico et al 2007; and Chatters et al 2009).

3.6 Limitation and Strength of the Study

Some limitations to this finding are highlighted. Firstly, only one focus group was carried out with most of the participant predominantly from same tribal background (Ibo tribe) in Nigeria. Moreover, recruitment was carried out primarily through one Church congregation, although intentionally targeted for its large number of African parishioners. This selection process may have excluded people of other religions or non-church goers; hence, generalizability of these results to all African women in diaspora might be limited.

Secondly, the fact that the researcher was of the same ethnic group as the participants may be viewed as a limitation, given that researchers conducting studies within their own communities have been historically accused of not being impartial by proponents of the outsider debate (Serrant-Green, 2002). It's been argued that partiality can be introduced in a qualitative study as the participants may be inclined toward telling an insider-researcher what they felt she needed to hear as a member of the community; however, there was no evidence of this occurring. Instead, the researcher being viewed as an insider (part of the community within which the research is conducted) may have contributed to the group's openness and to the quality of the discussion (Hellowell, 2006; Berger, 2015). The researcher in this study by sharing the same ethnic identity with the participants, may have instilled trust on the part of participants to disclose their thoughts more freely and honestly, hence providing richer data (Dwyer & Buckle, 2009; Berger, 2015). Researcher's shared identity with the participants meant that she understood their food choices, the language used to describe their local foods and other cultural needs of the participants.

Thirdly, the women in this sample were educated with most of them having tertiary education. While the findings from this study and the stories of the women are crucial to the understanding of the experiences of obese women of African descent in diaspora - NE Scotland, transferring these findings to obese women of other educational and social backgrounds may prove a challenge. However, evidence from the Scottish Census data suggest otherwise, as the "African" ethnic group category were reported to have had the highest level of qualification among all ethnic groups analysed (National Records of Scotland, 2018).

Consequently, it might be plausible to deduce that the educational profile of this study participants is a fair representative of the larger population of African women in the region, irrespective of the small sample. However, if the finding from this study can be extrapolated to the rest of the UK, then public health statements might become more appropriate.

Although there were limitations, the significant strength of this study lies on the fact that the sample comprised only African women (specifically Nigerians), from West Africa, who are residing in NE Scotland. This provides a unique insight into the perceptions of these women, all from the same region, with regards to the topic under investigation. Previous studies investigating similar issues on nutritional practices and barriers to healthy eating have been conducted with either Caucasians, a mixture of Caucasians and people of other African descent or ethnic minority (Tiedje et al, 2013; Baruth et al, 2014; Seguin et al, 2014) but not solely Nigerian population. Thus, this study bridges a gap in the knowledge regarding African women (especially those of Nigeria West Africans descent) living in NE Scotland.

3.7 Conclusion

In summary, the findings of this study highlight key food habits and eating behaviour of African women who participated in the focus group within their social context. It also highlights what meaning they give to food, what their favourites foods are and how often such foods are consumed in a typical day or week. Family dynamics was unveiled – who oversaw food preparation and determine food choices made for the family. The findings further indicate the challenges these women face in terms of food availability and cost (not dissimilar to other group of women) and how these can negatively impact on their choice of a healthy diet, inadvertently impacting individual's ability to maintain a healthy lifestyle and ideal weight.

The findings of this research also suggest that the rise in obesity among African women in Diaspora goes beyond conventional factors, such as sedentary lifestyles and availability of convenience food. As these life circumstances and environmental factors identified are not necessarily peculiar to African women in Diaspora, it might be argued that there is some element of behavioural factors,

(such as food choices) associated with weight gains among the African women in NE Scotland. However, it is important to consider that food choices may be dependent on their life circumstances or the environment they find themselves. Therefore, care must be taken to design lifestyle change interventions that are not generic but are tailor-made to meet the needs of this population.

These findings are important and can inform health policy and dietary interventions offered to this group of women. The increasing rates of obesity among women of African descent in the United Kingdom may lead to higher prevalence of obesity-related illnesses in the future more than it is currently reported if no action is taken; hence, putting an undue burden on the UK health sector. The results of this study provide some evidence on the current debate about African women as more accepting of larger body weight, viewing them as more attractive. This culture is fast changing as the women are less accepting their current body weight, pressured by significant others and in some cases had started taking measures to engage in lifestyle changes. It is important that this readiness on the side of the women is embraced in future research on weight loss intervention that will be tailored toward helping these African women achieve their ideal weight and lifestyle choices.

Overall, the rationale for the focus group was justified from the findings and its positive contribution towards the design of the main study. The information gathered ensured that the researcher was confident to approach Churches and other identified avenues for recruitment of participants in the feasibility dietary intervention study (See Chapter 5, Section 5.2.3).

More so, the refinement of the feasibility dietary intervention study's protocol from bi-weekly face to face follow-up to bi-weekly emails and/or phone calls follow-up was directly informed by the feedback from focus group where the participants indicated preference to be followed up electronically. To ensure that the follow-up is robust and systematic, both food diary and reflective journal were designed to be completed electronically (see sample of food and reflective diaries in Appendix E and F, respectively).

3.8 Key messages

- African women in Diaspora's knowledge of healthy eating/lifestyle was in contrast with their account of eating habits revealing inconsistent behaviours that inhibit the translation of such knowledge into lifestyle choices.
- The rise in obesity among African women in Diaspora goes beyond sedentary lifestyles and availability of convenience food: food choices are heavily influenced by women's life circumstances and environment they find themselves.
- Some of the factors such as life circumstances (busy lifestyles) and environment (exposure to sedentary lifestyle and fast food) identified as barriers to healthy eating and lifestyle are not peculiar to African women but has also been reported among other population, hence the need to consider behavioural components.
- The culture of African women as more accepting of larger body weight, as more attractive, reported in some previous literature; is fast changing as women in this study were less accepting of their current body weight, and pressured by significant others to lose weight as well.
- Lifestyle change interventions that are tailor-made to meet this population needs are required.

•

CHAPTER FOUR - REFLEXIVE INTERVIEW

4.1 Reflexivity

Reflexivity as a research concept emanates from anthropology but is applied across disciplines (Wilkie 2015). Its significance has been widely recognised within social science research; however, dilemmas still surround its practicalities, perceived ambiguity and subjective nature being debated, resulting in reflexivity not being widely discussed, as highlighted by these authors (Finlay 2002; Mauthner and Doucet 2003; Wilkie 2015).

Reflexivity is the process that challenges researchers to explicitly examine and acknowledge the assumptions and preconceived ideas, they bring into the research, which may influence their own research agenda or interfere with the outcome. It is presumed that researchers are seldom fully detachable, objective observers, given that every individual holds personal opinions, beliefs, values and preconceived beliefs, often shaped by their life's experiences and exposure (Polit and Beck, 2014; Wilkie 2015). Hence, our understanding and interpretation of the world is often influenced by these thought patterns, political orientation, culture, personal values, religion, ethnicity, and emotions which unavoidably influence the entire research process, such as selection and wording of questions, the interview process, response by participants, analysis, and other research decisions (Polit and Beck, 2014; Willkie 2015).

Qualitative research by nature is subjective as it seeks to explore the lived experience of the participants (Anderson, 2006, Tufford and Newman, 2012). The researcher is often the instrument of analysis in all the stages of the research project (Starks and Trinidad, 2007). This makes it probable for biases of the researcher to surface (Tufford and Newman, 2012), jeopardizing how data is collected and presented (Tufford and Newman, 2012).

However, reflexivity throughout the entire research process has been recommended; to ensure that researchers, while reflecting on themselves, makes the research process the key focus of analysis. This process promotes transparency and minimises the prospect of the researcher being misguided by

own experiences and interpretations (Alvesson and Sköldbberg 2017; Mauthner and Doucet 2003; Lear, Eboh and Diack 2018).

Generally, reflexivity is characterized as 'methodological self-awareness' where the researcher effectively turns the investigative lens away from others and towards him or herself (Wasserfall 1993; Seale 1999) with the goal of rigorously minimising contamination in the positivist worldview or essentially co-creating knowledge in the constructivist paradigm, which views the researcher as being always "written into the text" (Lynch 2000; Ben-Ari and Enosh 2011). The latter posits that both the investigator and those being investigated mould the encounter, and "research" becomes a means of producing joint knowledge instead of unearthing knowledge presumed to be inexistence (Mauthner et al 1998; McNair et al 2008; Hsiung 2010). Hence, the measure of thoroughness lies on the simplicity of identifying and revealing both personal and relational subjectivity instead of how strictly they are put under control (Jootun, McGhee and Marland 2009).

Divergent opinions remain on whether reflexivity results to more productive research, with Gilgun (2008) maintaining that reflexivity unveils researcher to a comprehensive "connected knowing," and Ben-Ari and Enosh (2011) advocating its usefulness in creation of new knowledge. Caution however is being aired by other researchers who does not agree that reflexivity on its standing results to a more robust research. Both Pillow (2003) and Finlay (2002) argue that reflexivity does not necessarily guarantee that participants' voices or their own reality are adequately represented.

Among several techniques employed for reflexivity by researchers, such as reflexive field notes (Hollway 2016), reflexive video focus groups (Liu et al 2016), reflexive diaries (Nadin and Cassell, 2006; Clancy 2013), reflexive member-checking (Doyle, 2007), reflexive interviews are viewed as the most routinely adopted reflexive tool (Nadin and Cassell, 2006; Cho and Trent 2006). Reflexive interviews are also referred to as 'bracketing interviews' (Finlay, 2008; De Cruz, 2016), often conducted to enable researchers to identify and suspend any pre-existing assumptions, biases, preconceived notions, past experiences; knowledge of previous findings and theories regarding the research topic in order to listen to participants account open-mindedly (Drew, 2004; Gearing, 2004; Stark and Trinidad, 2007). This terminology is not utilised within this paper, rather reflexive

interviewing as a much broader than merely a 'bracketing interview.'

Reflexive interviews are compared to storytelling where the interviewer seek to unearth the various meanings of what is said and heard (Lear et al, 2018). The interviewer probes and reacts during the interview process, seeking the full story while watching out for underlying preconceptions, biases and beliefs that may have accrued through experience. On the other hand, the interviewer may inhibit undisclosed bias that can influence understanding of the original message of the storyteller, leading to the story being twisted, resulting to making bias interpretation of the data (De Cruz, 2016). Spoken words and their underlying meaning are means of qualitative reflexive data that add richness to a study potentially exposing bias, hence the importance of reflexivity in safeguarding the data process.

Finally, reflexive interviews can elucidate the positioning of the researcher relative to the interviewee (Foley 2002). When applied appropriately in research, they can improve validity of outcome. In the example of Rolls and Relf (2006), reflexive interviews were adopted to unveil the emotional position of the researcher thus increasing the validity of the study (De Cruz, 2016).

4.2 Aim

In this research, a reflexive interview was undertaken to enable the researcher to acknowledge her role in the research design, data collection, analysis and knowledge production. It is imperative to provide a transparent and valid account of experiences of obese African women in diaspora in this study. As an African woman in diaspora herself, who had struggled with being overweight and who shared several attributes— gender, race, social class, religion, and geographic location with the research population, the researcher stands socially located in proximity with this population. There is, therefore, a high probability of the researcher coming into the study with ideas and emotions that can significantly influence not only the data gathering but also the analysis process.

To mitigate against bias resulting from close location, the researcher opted to undergo a reflexive interview using the same questions and prompts from the focus group (Table 3:1). The reflexive interview was undertaken following the

focus group, prior to conducting the feasibility main study which included post-intervention semi-structured telephone interviews. An experienced qualitative researcher, unrelated to the study, carried out a semi-structured interview with the researcher, who will be referred to, as the 'respondent' within this context.

The reflexive interview was primarily undertaken to identify pre-held assumptions and preconceptions, acknowledge them to become aware of the researcher's own personal journey and that of the participants. This is important as qualitative research has been argued to embody elements of subjectivity (Anderson, 2006; Tufford and Newman, 2012; Cunliffe and Locke, 2016), with the researcher being an indispensable part of the process and results, making it impossible for the researcher to be completely detached from this (Starks and Trinidad, 2007; Tufford and Newman, 2012). To ensure rigor of qualitative research, focus should be on the researcher taking necessary steps to ensure transparency and critical self-reflection on those preconceptions, relationship dynamics and the process of data collection, analysis and presentation (Polit and Beck, 2014).

The reflexive interview exercise further enabled the voice of the participants to remain prominent and not overpowered by that of the researcher, while providing valuable insight into the researchers' stance on the topic and potential biases. It further helped to revise and refine the interview prompts that were later utilized in the post-intervention semi-structured telephone interviews.

4.3 Method (of analysis)

There are several approaches to analysing qualitative data, including those that are concerned with languages and how it is used within social interaction like discourse analysis (Fairclough, 2013) and ethnomethodology (Garfinkel, 1996). Other approaches pay close attention to experience, meaning and language such as phenomenology (Svenaeus, 2001) and narrative methods (Reissmann, 2008); whereas grounded theory aims to develop theory obtained from data through a set of procedures and interconnected stages (Charmaz, 2006). A lot of these approaches are integrated with distinct disciplines and are underpinned by philosophical ideas which shape the process of analysis (Crotty, 1998).

However, Framework analysis is not particularly aligned with a specific epistemological, philosophical, or theoretical approach (Gale et al, 2013), instead,

it is an adaptable tool that can be utilized with diverse qualitative approaches that intend to generate themes. Unlike other qualitative approaches that adopt the 'constant comparative method,' associated with grounded theory (Boeije, 2002), the Framework Method is not particularly interested in generating social theory, but can promote constant comparative techniques through the review of data across the matrix (Gale et al, 2013).

Framework analysis is popularly used in health care setting (Gerrish et al 2004; Read et al 2004), however it has been utilised in several other sectors, for instance, Balley et al (2004) used it to assess information retrieval from the internet; whereas Archer and colleagues (2005) used it to investigate student performance. These and many other authors' attest that framework analysis is appropriate for several reason: it is comprehensive in nature; it is principally based on the participant's account and observation; it demonstrates transparency by allowing others access to the original textual data (School of Nursing and Midwifery, 2002; MORI Social Research Institute, 2003); and it provides a focus and repeatable procedure in the area of policy research (Srivastava and Thomson 2009). Its flexibility during the analysis process allows the user option of engaging in data analysis during the collection process or analyse at the end of the data collection (Srivastava and Thomson 2009).

Despite the systematic features of framework analysis, caution is sounded that this method is not always suitable for analysing every type of qualitative data or capable of answering all research questions. For instance, the framework method cannot deal with highly heterogeneous data as it will be impossible to categorize key issues (Gale et al, 2013). However, Ritchie and Spencer (1994) affirm that it is appropriate for analysing qualitative data obtained in form of focus groups, participant observation and interviews, particularly semi-structured interviews.

In the light of the above argument, qualitative data collected from both the focus group and post intervention interviews were all analysed using Krueger's (1994) framework analysis, incorporating some key stages of Ritchie and Spencer (1994) framework analysis which includes: familiarization; identifying a thematic framework; indexing; charting; mapping and interpretation as shown in Chapter 3 and Chapter. Having utilized the framework analysis in the analysis of the earlier studies, further instilled confidence on the researcher to incorporate it alongside the voice-centred rational method of analysis in analysing the reflexive interview

data, as mentioned below.

Reflexive analysis focuses majorly on self-awareness and aim to reveal underlying assumptions and beliefs that may be difficult to uncover through some of the traditional method of qualitative analysis (Finlay 2002; Lear et al 2018), hence the need to adopt appropriate reflexive method of analysis. Mauthner and Doucet (1998) suggested voice-centred rational method of data analysis (Brown and Gilligan 1993), as one of the few methods incorporating reflexive elements. However, alongside the voice-centred rationale method, the researcher decided to incorporate the framework method of analysis, to allow her to carry out basic search for themes that captured her experience and enable a reflexive process.

As its principal analytical tool, the voice-centred rational method of data analysis adopts a Listening Guide (LG) comprising four sequential reading of the interview text (Mauthner and Doucet 1981; Mauthner and Doucet 1998), focusing on the voices of the research participants in telling their stories and perspectives. This assumes that the voice of individuals is complex and often multiple voices are obtainable within a narrative (Brown and Gilligan 1993, p. 15).

It further posits that individuals might experience multiple, sometimes contradictory, ways of thinking about and understanding situations (Brown and Gilligan 1993). In this approach, the way an individual narrates their stories, that of others and relationship gives an understanding into how they perceive such experiences (Brown et al 1991; Brown and Gilligan 1993; Mauthner and Doucet 2003). A person's voice is potentially amplified or muted by their societal and cultural environment (Brown et al 1991; Brown and Gilligan 1991).

Mauthner and Doucet (1998) exemplified the use of the LG method in applying reflexivity to the evaluation of their doctoral research experiences, several years after completion of their thesis. Similarly, and more recently, Lear et al (2018) adapted the same technique from Mauthner and Doucet's (1998) LG, while incorporating Joplin's (1981) experimental educational model, in the analysis of her reflexive interview undertaken to minimise potential bias within her doctoral study, examining the unfavourable experiences of nursing students studying abroad (Lear et al 2018). Both papers demonstrate the applicability of this method in reflexivity. Additionally, Lear et al (2018) recommend extracting themes from the reflexive notes while following the four readings. The analysis of this reflexive interview will be presented similarly using the same four reading guides.

4.3.1 First Reading

The LG first reading provides a practical guide for the researcher to engage in a reflective reading of the interview text or narrative, using an element of 'reader response.' This allows the researcher to position herself, her background and experiences in the same trajectory to that of the respondent (Mauthner and Doucet 2003) while focusing on her own emotional and intellectual responses (Brown and Gilligan, 1993). The first reading invites the researcher to become conversant with the specifics of the narrative plot, to facilitate her understanding of the who, what, where, when and why (Gilligan et al 2003; Brown and Gilligan 1993). She looks for the prevailing message, omissions, repetitions, contradictions or other details unequivocally articulated by the participant (Gilligan et al 2003; Cruz 2003).

A 'worksheet' technique is then utilised to outlay respondent's words as well as the researcher's reactions and interpretation in an adjoining column (Gilligan et al 1992; Mauthner and Doucet 1998, Mauthner and Doucet 2003); a process that allows the researcher to explore how her personal, theoretical, political views and assumptions are likely to influence her interpretation of and subsequent reporting of other respondents' words. Additionally, this reading is based on the epistemological assumption that intellectual and emotional reactions to other people constitute sources of knowledge (Hammersley and Atkinson, 2007; Miles and Huberman 1994; Mishler 1986).

4.3.2 Second Reading: Tracing Narrated Subjects (I poems)

During the second reading of the interview transcript, the researcher focuses on how the respondent is absorbed within the framework of their social world. It explores how the respondents speak about themselves, while examining the voices within the narrative. Through this process, researcher's attention is drawn to the respondents' perception of self through the active use of 'I' in telling their story, while laying emphasis on the areas respondents grapple to 'define self' emotionally or intellectually.' The 'I' reading further pinpoints the divergent meanings respondents give to self by highlighting areas of switch between 'I', 'we',

'you' or 'it' (Stanley 2002). This process places respondents in the centre of the text, compelling the researcher to evaluate respondents' perception of themselves, hence promoting a more reliable assessment of the respondents (Brown and Gilligan 1993: 27-28).

In the second step of the LG process called the I Poem, phrases containing the first-person pronoun, "I", were underlined, extracted from the interview transcript and arranged into stanzas. This personally centred pronoun (I Poem) demonstrates individual's sense of self and often represent something indirectly stated but pivotal to making sense of what is being declared (Gilligan et al 2003). The "I" poems were also extended to incorporate pronouns such as "you," "we", "us", "they". These not only provided the researcher with deeper understanding of herself as a respondent, but also enabled her to explore the shifts between these pronouns (Paliadelis and Cruickshank 2008; Doucet 2008), which have been posited to represent shifting "perceptions of self". They also provide another opening into discovering and understanding of self as well as others' views of them (Paliadelis and Cruickshank 2008; Doucet 2008).

4.3.3 Third Reading

The third step in the LG entails listening for the participants' contrapuntal voices (Gilligan et al 2003). The researcher focuses on capturing the different voices, or themes, that interrelates and coincides to better understand the participants view of themselves and relationship to society (Gilligan et al 2003; Woodcock 2010). This basis calls for meticulous consideration multiple voices that possibly relates with each other, that would have been difficult to recognise and to further explore individual's perception of themselves and others" (Brown 2001 p.97).

It is mostly advocated that not less than two voices in each narrative is sought for, in order to have a clear capture the participant's "multiplicity of voices" (Gilligan et al 2003, p.165). As Gilligan et al (2003) suggested, the researcher identifies those voices that are being sought with relation to the research question. These voices are then highlighted to reveal relationship between the voices –

whether there are conflicts, harmony or contradictions is connected (Gilligan et al 2003). These points of intersection will then become points of interest for the researcher and key for the discovery of new understandings regarding the research topic.

4.3.4 Fourth Reading

The fourth step of the listening guide involves composing an analysis of all the data that was generated in each step, which included the researcher's reflexive notes, researcher's responses as well as interpretive summaries (Gilligan et al 2003). The entire steps involved in applying LG is labour intensive as the researcher has to incorporate, synthesize, and consider all interpretations and notes generated up to that point (Sorsoli 2008). The evidence is then assembled, and lessons learned about the research questions, through this process is pulled together by the researcher, at this point.

4.4 Analysis and Findings

4.4.1 First Reading

The first reading of this analysis comprises two components. In the first part, the researcher, who is also the respondent in this study, listens and scrutinizes for the plot, looking out for the narrative being told, images and prevailing themes within the context of the whole transcript. The second part explores the researcher's response to the listening, noting her social location with the participant, her emotions, connections and/or disconnection with or from the participant (Mauthner and Doucet 1998).

Considering that the first step of LG method requires looking for and identifying prevailing themes and repetitive details of the narrative, the researcher incorporated the Krueger's (1994) framework method of analysis to aid this process. Krueger's (1994) framework approach to qualitative data analysis was utilised as it provides clear and easy to follow practical steps to aid analysis of individual data as well as focus group data (Krueger,1994; Draper 2004 and Fade

2004). Following this methodology, the transcript was subjected to five key stages of Krueger framework analysis: familiarisation, identification of thematic framework (memoing), indexing, charting and mapping/interpretation (Krueger 1994).

Although thematic and pattern analysis is not the principal focus of the LG and the fact that LG method views categorization as being too restrictive, the researcher employed this technique to ensure that the themes embedded within the interview transcript are identified in order to inform in-depth analysis. Following the analysis for each of the questions asked during the interview, major points were identified, with a succinct statement regarding the general response to that question. Quotes from the interview transcript were chosen to demonstrate and provide further understanding into the themes and categories that emerged from the analysis. These are all presented in the Appendix G.

Key themes identified included:

- Theme 1. Researcher's knowledge and perception of obesity and related factors: Subthemes – Awareness of obesity-related diseases, perceived severity and fear of the impacts of the diseases, and dietary beliefs.
- Theme 2. Socioeconomic and cultural-environmental factors impact: Education, information/awareness, financial and social status, cost and availability of African foods.
- Theme 3. Possible conceptual baggage identified – researcher's preconceptions and personal experiences, lessons learnt, and changes effected (outcome and benefit of the reflexive exercise).

In keeping with Gilligan et al's (2003) outline of the LG method, the researcher continued the second part of the first reading by examining her own responses to the narrative, highlighting her social location, her thoughts and feelings, connections or disconnection with the narrative in question (Mauthner and Doucet 1998). Below is a narrative and some highlights of the researcher's thoughts, ideas, ensuing reaction derived from the 'reading' of the reflexive interview transcript. Personal information that might influence researcher's decision of and handling of the data is also shared, serving as a trail of evidence and transparency:

The highlight of the researcher's narrative seems to be one of cyclical struggles

with weight management post-migration. As an African woman who accompanied her husband to Europe from Africa, on an expatriate assignment by spouse's employer, she was taken aback by how much weight she'd amassed within a decade of arriving to the NE Scotland. The researcher's struggle with being overweight and the search for how to sustainably maintain healthy weight was responsible in part for the onset of her journey into enrolment in the postgraduate Obesity Science and Management course (MSc.). The knowledge gained in the MSc program, subsequently served as a catalyst to her desire to explore the area further by enrolling in a PhD program, committed to contributing to empirical evidence to inform a solution to the obesity epidemic among African women in diaspora.

At the centre of the researcher's narrative are the prevailing plots of:

- Who the researcher is – the personal characteristics that defines her social position? She is an African woman who has lived in NE Scotland for over a decade and struggled with weight gain as well as its negative impact on her health and wellbeing.
- The researcher's personal struggle and experiences associated with weight gain and her subsequent effort to lose weight, which was only successful in part, as the weight lost was frequently regained and then lost again.
- Her overall experience has resulted in increased awareness as well as overt obsession with food choices and general outlook to diets as indicated in the few selected quotes "... right now, I am very picky and I'm conscious of what I put inside me." "I compare our body to the engine of a car, you know, what you put in is actually what you get." "I am always careful like reading labels... "I'm more conscious now, that's what I mean by being mindful."
- Socio-economically, the researcher was in an advantaged position (a spouse to an oil worker) and view reduced accessibility and availability of healthy African food as main barrier, secondary to cost. This might not be the situation of other participants whose

socioeconomic position might differ from that of the researcher.

- Cultural perception of obesity acceptance – there was strong evidence of bias on the researcher’s view and conceived notion on existing cultural acceptance of obesity back in her home country “... back at home some people still feel that ‘fat is beautiful.’ So, perhaps if I was still at home, maybe I would have been thinking that way, but it’s changing too.” “Back home it’s common where we feel, if you husband has money, it should show on you. But when I came here, it’s the opposite, people are really wanting to be skinny, skinny and is admired but back home....

Although the researcher acknowledged at the end that this positive cultural acceptance of obesity might be changing, her views are not supported by any evidence, making this possibly conceptual baggage going into the study. This sort of pre-conceived notion might influence researcher’s choice of wordage and probes utilized because of the type of answers she might be expecting from participants.

4.4.2 Second Reading

When the ‘I’ Poem task was performed with the transcript of researcher’s interview, some surprising discoveries on potential biases held by the researcher were made. More so, this process revealed contradiction in the voice of the researcher (respondent in this case), often informed by what question she was asked. Table 4.1 contains excerpts of ‘I’ and insight into researcher’s (respondent’s) feelings, views and positioning.

Table 4. 1 The "I" poem extract

"I" Statements	Meaning
<p>I am very picky I'm conscious of I'm more conscious I am always careful I mean by being mindful I know I think I'm more I now go for I know I know it will I think I think I have I decided I've tried I will try</p>	<p>In these stanzas, the respondent is heard through the 'I' Poem repeatedly reiterate who she thinks she has become by comparing what her habits were in the past and the changes that has occurred in her and the active healthy choices she makes. These stanzas are useful in understanding where she is during her journey and her current position (location), as this is likely to influence the way she views the choices other participants make. Will she be judgmental of them?</p>
<p>I personally have had struggles I struggle</p> <p>You give you are you just go much you don't You are not you finish you have</p> <p>I go I go I see I came I have I wanted</p>	<p>This 'I' poem stanzas are vital to understanding the respondent's journey and the meaning she gave to it. Here, she recalls her painful <i>go, I go, I see, I came.</i>" It's interesting to note these interchanging as it reveals the respondent speaking in different voices, finding it more comfortable to refer to herself in a third person when actions are negative, "<i>you go for cheaper ones, you give all the excuses, you are buying wrong things,</i>" but reverts to first person when actions are positive, "<i>I go to African food store, I go for better ones, I have two options, I wanted to find.</i>"</p>

Utilizing this step of the LG enabled the researcher to listen to the way she speaks

of and describes herself through the switching of the personal pronouns (Balan 2005), "I," "you," and "we," as well as paying attention to what the researcher knows of herself. Additionally, by listening for possible racial, cultural and class biases, accessing what may not have been stated explicitly, the respondent's voice is heard prior to being influenced by interviewer's own views of the narrative. This allows a better comprehension of the respondent's world and fosters a relationship that works against distancing from such an individual in an objectifying way. Engaging in this process of identifying the "I" phrases and other personal pronouns subsequently will be beneficial during future analysis and will serve as a trail of evidence of self-disclosure, providing the researcher with deeper understanding of herself and identities.

The performance of the 'I' reading of the LG and being conversant with this process, did not only foster self-disclosure of the researcher (as a respondent) in this case; but further enhances her understanding of the underlying assumptions associated with the use of personal pronouns the participants in her study may adopt. For instance, Petrovic et al 2015 account of how LG was utilised and guided their analysis of a study that investigated individual critical reflection papers by 27 fourth-year dietetics university students (Petrovic et al 2015), they examined some of the fundamental beliefs associated with the use of personal pronouns. In the performance of their second reading, their analysis and reflexive writings were guided with such questions as, 'what and to whom is the participant referring to, when she/he uses "I"? To what is she/he referring to, when she/he uses "we," "they," or "you"? "What differences and what similarities regarding the level and type of self-disclosure are found between the use of "I," "we," "they," and "you" in the narratives (Stanley 2002)? Finally, what do these differences indicate? Like Petrovic et al 2015, reflecting on these questions enabled the researcher to examine shifts in her perceptions as a respondent, and adopt similar strategy in her interactions with participants within her study.

Key assumptions and views of perception of self that emerged during this reading included the researcher's continuous reiteration of her increased knowledge, awareness and changing attitude towards being overweight or obese. Her disclosure of and perception of 'not making healthier choices,' or 'becoming overweight' post-migration as her fault, are a few of the assumptions that were identified as a possible baggage that might influence her judgement or cloud her understanding of the stories of other participants during this study.

This aspect of the reflexive interview unearthed this possible baggage on positioning and location of the researcher, which she ought to be mindful of throughout the research process. This method enables the researcher to listen to her own experiences in a manner that acknowledges her individuality as a respondent and not objectifying herself. By using the voice-centred relational approach, the researcher is attuned to her many voices leaving her better-equipped to unearth the unexpected.

4.4.3 Third Reading

During this process, the researcher paid attention by listening to the existence or non-existence of the respondent's emotional input by means of personal self-disclosure in the interview transcript. This was detected by respondent's intertwining significant past experiences and personal characteristics that enables the interviewee to get familiarized with her and her personality. The more sensitive the self-disclosures are, the richer the context they provide to the contrapuntal voices identified and the louder the voices become. On the other hand, lack of personal self-disclosure also impacted the identification of other contrapuntal voices. Table 4.2 outlines and explains some of the contrapuntal voices heard throughout the reflexive interview's transcript.

Table 4. 2 Contrapuntal voices of researcher as the respondent

Contrapuntal Voice	Description
Regrets	<ul style="list-style-type: none"> • Captures feelings of self-blame for past actions. • Reveals evolving journey of the respondent and lingering feelings of uncertainties. • Captures respondent's strong beliefs, perceptions that are logical but not emotional. • Revolves around the respondent's height of self-awareness and increased knowledge. • Captures respondent's changing mindset.
Conviction	
Controlling	<ul style="list-style-type: none"> • Captures respondent's demonstration of wanting to be in control by insisting the family stick to healthy eating.

4.4.4 Fourth Reading

One of the bedrocks of the LG is the ongoing reflexive writing assumed by the researcher, especially during the data analysis stage (Gilligan et al 2003). As the principal author of this study, my thoughts, interpretations, associations, disassociations, and other relevant notes were documented throughout the four readings. This results to trail of evidence that enables the researcher and prospective readers scrutinize or probe actions carried out or omitted and discover likely aspects that may need further investigation (Mauthner and Doucet 1998; Richards and Morse 2007).

Additionally, the reflexive writing enhanced the understanding of and highlighted potential prejudices as well as inherent biases that may have influenced the data analysis (Mauthner and Doucet 1998 2003). Such continuous reflexivity within qualitative research is paramount in establishing transparency (Mauthner and Doucet 2003), acting as an important validity check of the formulated interpretations (Mauthner and Doucet 1998; Richards and Morse 2007).

4.5 Discussion

Reflexivity is important for revealing any preconceptions so that the researcher does not misrepresent the research data and misinterpret them. This reflexive interview was primarily undertaken to identify any pre-held assumptions and preconceptions the researcher might have regarding her experience of being overweight post-migration to diaspora, coming into the study—to acknowledge them and be aware of her personal story and how that could impact the study. The goal was not to discard these preconceptions and assumptions the researcher might have, as it will be impossible to do so (Polit and Beck, 2014). However, these assumptions are meant to be acknowledged and described to demonstrate that the researcher has been critically self-reflective about their preconceptions, positioning and transparent about the entire process of collecting, analysing and presenting of the data. By so doing, reflectivity further allows the researcher to bracket (set aside) these preconceptions.

The analysis of the reflexive interview revealed crucial and salient points. First, the personal characteristics that define the researcher's social and professional positioning was unearthed. The researcher's considerable knowledge and awareness gained from personal experience as well as academic exposure are likely to confer some level of power on her, hence creating power imbalance between her and the participants. In relation to power or presence, both Brannick and Coghlan (2007) and Berger (2015) highlight the importance of a researcher reflecting on the impact their positionality may have on the participants or the setting. Acknowledging and consciously contemplating on the social context from which the researcher came into the study is a necessary step to enhancing transparency; as well as minimising apparent sources of bias into the study (Polit and Beck, 2014).

Moreover, the researcher's personal struggle with being overweight since arriving in NE Scotland and the attendant negative experiences on health, which were the catalyst for her journey into this research, would certainly have a profound impact on the ways she views the struggles of other African women battling with obesity in diaspora. The researcher's experience—a combination of weight gain, some sort of successful weight loss and changes of mind-set overtime— creates a unique viewpoint for her, her beliefs, perceptions and presumptions that might cloud her ability to look beyond her own story and view every participant as having a unique story different from hers or anyone else. On the other hand, the researcher's experience might invoke empathy and other strong emotions towards these women with shared experiences, prompting her to listen to their unique stories non-judgementally.

Recognising and acknowledging the above standpoints via utilizing LG does not resolve issues of any inherent existing power relations between the researcher and participants during the research study. However, this process ensured the researcher acknowledges and accounts for such existing power by conscientiously not seeking to control the research and producing analysis that includes the interests of all knowers (Smith 2005). This was reflected in the researcher's choice of probing prompts utilized when participants gave short answers or digressed from the question. For example, prompts such as 'Tell me about your experiences using dietetic booklet...', 'How did you manage these experiences...?' were utilized as it allowed participants to tell their story in their own words and did not appear to be leading the participants.

In hindsight, the reflexive exercise enabled the researcher to become aware of how her experience could have guided her research, and how these experiences might have shaped the ways of 'seeing' and 'hearing' the participants both during data collection and in the interpretation of their account during the subsequent data analysis processes. For instance, using the 'reader-response' reading of the voice-centred method, the researcher was able to explore how her experiences with being overweight could influence her interpretation of the participants accounts. This reflexive exercise helped her identify where this appeared to be limiting her understanding of other people's stories, a limitation that was articulated and enhanced through the process of reflexivity.

Utilising LG, information on possible inherent preconceptions and views of the researcher emerged from her personal experiences. Two potential areas of bias were the researcher's perception that 'obesity occurs as a result of personal choices,' positing that as an individual, she could have averted her being overweight if she had made better and healthier meal choices. While this assertion might be theoretically true, carrying such a guilt or perception into the research study might influence the way the researcher treats, responds to the participants who might have a totally different experience from hers. It could also influence the choice of questions or prompts utilised during the study and more importantly, the meaning/interpretation the researcher gives to the participants' story during the analysis stage.

Another possible area of conflict was a cultural notion of what a healthy weight is. For instance, the researcher still believes that, "... back at home (Nigeria) some people still feel that 'fat is beautiful. "So, perhaps if I was still at home, maybe I would have been thinking that way..." Recognising these potential avenues for conflicts enabled the researcher to become aware of her own assumptions (bracket these assumptions) and to maintain a neutral stance in order not to influence her data collection or analysis. This recognition influenced the researcher's search for and identification of relevant literatures that yielded considerable information on the widespread changing attitudes and cultural shift from acceptance to non-acceptance of obesity.

The reflexive exercise provided the researcher the opportunity to include new additional questions, ask questions differently, revise and re-frame questions as well as the research topic as the project unfolded. As the researcher comes to

identify her assumptions and preconceptions, questions were revised for the next round of interviewing. For instance, few additional questions were included in the post-intervention interviews such as: 'What made you decide to volunteer to take part in this study? And 'Tell me your overall experience whilst on the diet.' Unlike the questioning structure used in the focus group, the revised questions in the post-intervention interviews were more open-ended so as not to restrict participants or unintentionally influence participants' responses to questions or collaborate with only those with similar experiences to that of the researcher.

The sequence of the questioning was also revised; for example, the focus group discussion kickstarted with a direct question on the subject area: "What does healthy eating and weight mean to you?" Dissimilarly, the post intervention interview questions were arranged seamlessly starting with questions that allow the researcher to gain more insights into the participants' journey, such as: 'What made you decide to volunteer to take part in this study? And 'Tell me your overall experience whilst on the diet.'

Additionally, the reflexive interview served as an avenue for the researcher to improve her interviewing skills. Close observation was made on the interviewing style and decorum of the experienced researcher that conducted the reflexive interview. The independent interviewer's expertise, style of asking questions and utilisation of probes and his ability to move out of the stipulated questions in search of deeper meaning and answers were keenly observed and adopted by the researcher to improve her interviewing skill. This learning positively influenced the researcher's composure during the post intervention interviews, the rewording of her questions and utilization of probes during the post intervention interviews. The researcher also gleaned experience and learning from the interviewer's style of questioning and the ample time the interviewer allowed her to answer the questions without any form of pressure or leading.

Learning to allow the respondent to do more of the talking while the interviewer listened without interference and only intercepts where necessary, with appropriate probes, was another interviewing skill gained. These lessons positively impacted how the researcher conducted her post-intervention interviews – she was measured in her words, listened more to the participants, gave ample time for answering questions and gave appropriate prompt without leads.

4.6 Conclusion

This chapter of the thesis highlights the importance of reflexivity in social research. Reflexive interviewing was employed to identify, acknowledge and minimise the risk of the researcher's experiences with being overweight, biasing a doctoral study on this subject. The reflexive interview was successful in exposing implicit preconceptions and views, that enabled the researcher to take appropriate measures to ensure transparency and improve her research outcome. Although, a researcher cannot totally detach herself from her experiences, whether past or present, acknowledging and documenting them ensures there is a check and balance. More importantly, it will serve as a trail of evidence to maintain transparency.

CHAPTER FIVE: DIETARY INTERVENTION FEASIBILITY STUDY

5.1 Introduction and aims

This chapter presents the dietary intervention, including a brief introduction to the purpose of the study and an outline of the findings. These findings are then discussed with supporting evidence and references from appropriate literature.

This mixed-method study involved a dietary intervention experimental design and a post-dietary intervention interview. The first phase (dietary intervention) of the study was a feasibility study in which thirty-three obese African women in Northeast (NE) Scotland were randomised to one of two diets: High Protein Low Carbohydrate (HPLC) or 600 Calorie Deficient Diet (CDD). This novel study aimed to compare a 600 CDD with HPLC diet to assess the effectiveness in inducing weight loss and acceptability of the two diets among obese African women in the NE of Scotland. Eligible participants were randomly assigned to either HPLC or CDD for an active phase of 12 weeks. Changes in weight were considered as the main outcome and a good indicator of the effectiveness of the assigned diet. A diagram depicting the dietary intervention feasibility study is presented in figure 5.1.

The design and delivery of the intervention study were informed by the outcomes from both the focus group discussion and the reflexive interview. The outcomes from the focus group informed recruitment strategy, enabled researcher identify participants' profile and locations to recruit them, viz, churches, universities, African organisations etc. The follow-up strategy incorporated into the feasibility study with the aim of reducing attrition rate, was directly informed by the outcome of the focus group, where participants indicated preference to be followed up remotely instead of the conventional face-to-face follow-up.

Both focus group and reflexive interview outcome informed the modification, reframing and restructuring of the post-dietary interview questions to better elicit relevant information that answers the research questions, in addition to provide the basis for the rigor in methodological design, incorporating triangulation

approach that enables comparison of outcomes from qualitative and quantitative data collected for completeness and complimentary purposes.

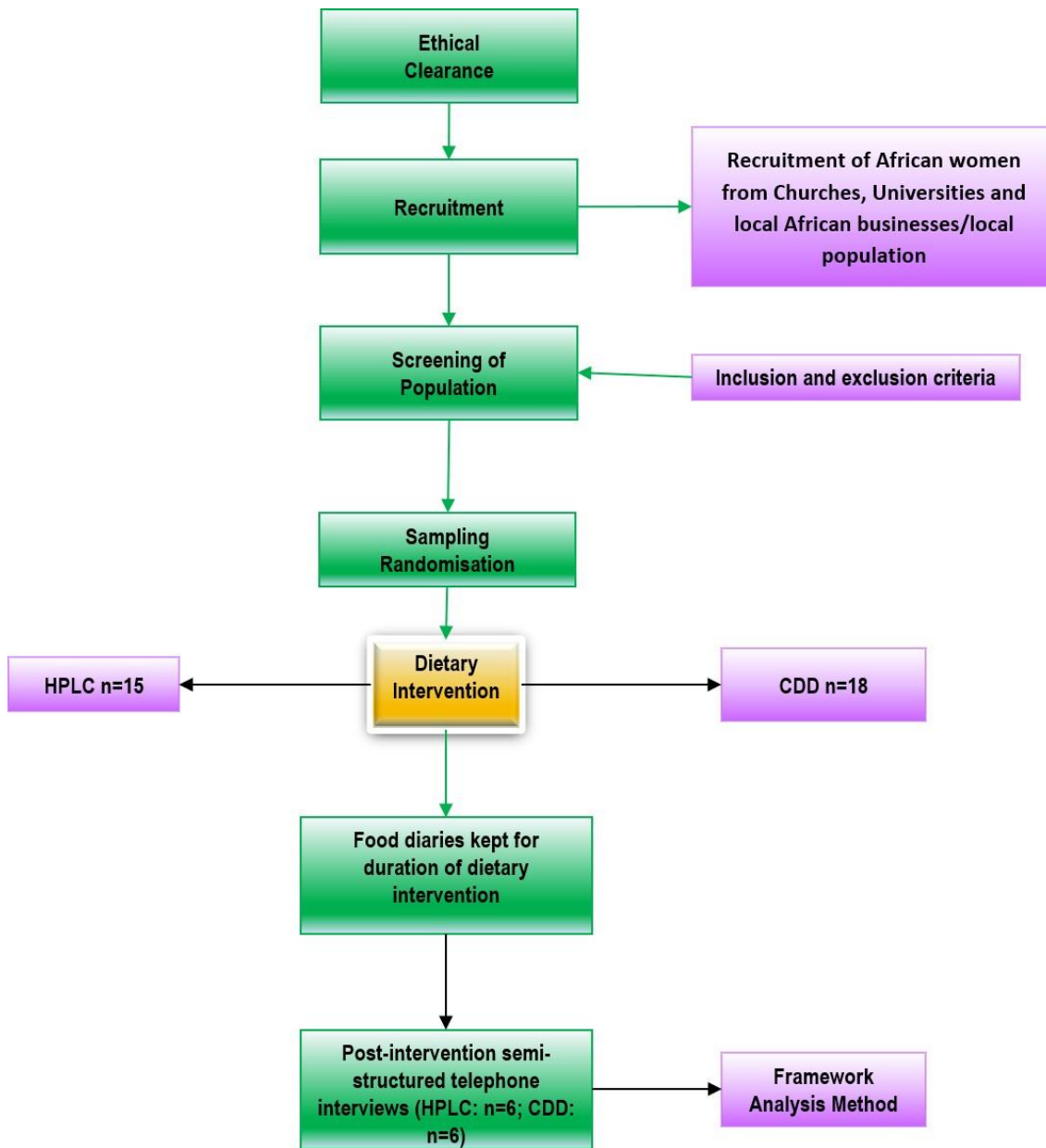


Figure 5. 1 Overview of the dietary intervention feasibility study

5.2 Method

5.2.1 Dietary Intervention

After obtaining informed consent, 33 women were enrolled and randomly assigned into one of two diet treatment groups, the HPLC diet group (n=15) or the CDD diet group (n=18). Using the Schofield and Harris Benedict equations, a method of predicting the basal metabolic rate (BMR) in kcal/day (kilocalories per day) from body mass (kg) in adult individuals (Schofield, 1985), 600 kcal was removed from the CDD participants' daily energy intake. The amount of energy permitted was then split into portions of different food groups, while explaining portion sizes with further written information. The equations for calculating BMR in kJ/day (kilojoules per day) from body mass (kg), for both men and women are shown in the table below:

Table 5.1 Calculating BMR using the Schofield equation. W = Body weight in Kilograms. Adapted from Schofield 1985 equations for estimating BMR. (Schofield, 1985).

Men
18-29 years BMR = $15.0 \times W + 656$
30-60 years BMR = $11.4 \times W + 870$
Women
18-29 years BMR = $14.8 \times W + 485$
30-59 years BMR = $8.1 \times W + 842$

For the HPLC group, participants followed a Protein Sparing Modified Fast (PSMF) (Robertson et al 2002; Bakhach et al 2016), which is a low carbohydrate, high protein diet, defined as an ad libitum low calorie diet consisting on average of 50% of energy derived from protein, 40% from fat and only 10% from carbohydrate, not over 40 g/day (Robertson et al 2002) of carbohydrate.

Participants assigned to HPLC after the screening were provided with an information booklet which explains how to follow the diet and that they should restrict their carbohydrate to $\leq 40\text{g/d}$ (see Appendix H). Participants were also

encouraged to include fruits and vegetables in their carbohydrate allowance.

Common foods included in the PSMF program were lean meat, fish, eggs, green leafy vegetables and generous intake of at least 2 litres of water to compensate for possible water loss (Gryka 2011; Bakhach et al 2016). A multivitamin supplement containing the recommended dietary allowance was prescribed for participants in the HPLC group.

5.2.2 Inclusion and Exclusion Criteria

Participants were included if they were female adults of African origin, aged 18 years and above, with BMI over 30kg/m² or ≥28kg/m² with known obesity related comorbidities such as pre-diabetes, type 2 diabetes, hypertension, sleep apnoea, and osteoarthritis. They were, however, excluded if they presented with any of the following conditions: renal or hepatic disease, cancer, coronary heart disease, diet related illnesses, obesity-related pharmacotherapy, pregnancy, or lactation. Participants were also excluded if they had participated in other dietary related studies within the three months prior to enrolment.

5.2.3 Recruitment Strategy and Procedure

Prospective participants were recruited from churches, universities, and shops supplying African food, as identified through the focus group. The aim was to recruit a sample of 30 participants (15 in each dietary group) who were randomly allocated to the two types of diets. The rationale for 30 participants was to ensure that there were enough participants to have adequate sample size for the post-intervention follow-up focus groups originally planned; however, the protocol was subsequently changed to one-on-one telephone interviews due to the transient nature of the study population. Some of the participants were students who moved to other countries or other parts of the UK after graduation. Others were married women that moved with their husband's transfer or assignment to other locations, hence the difficulty encountered in organising the post-intervention focus group, following the 12-weeks dietary intervention.

Prior to deciding if the study was relevant to them, an information sheet detailing

why the research was being conducted and what it involved was given to the prospective participants (see Appendix K). They were encouraged to take time to read the information and to ask questions if the information was not clear. Once the participants agreed to participate in the study, they were invited for baseline screening and interview to determine their eligibility.

At this visit, eligible participants were assigned to either a HPLC or CDD group. They also received detailed information on their assigned diets with a food diary (see Appendix E) booklet (and soft copies sent via email) to complete and return electronically, during the first week of starting the diet. Another 3-day food diary collection was repeated at the middle of the study (6th week) and a final one at the end of the 11th week intervention. Participants were advised to keep a reflective diary of their dietary journey (all these were provided electronically via email, with instructions on how to complete them) – see Appendix F.

Participants were encouraged to record the type of food and beverages consumed over three days, including at least one day of the weekend and two- week days during the recording period. They were also encouraged to record portion sizes of their foods and weigh them where necessary (See Appendix E for food diary template and instructions for completion).

Where participants consented, a letter was sent to their General Practitioners (GPs) informing them of their participation in the dietary intervention. A follow-up letter was sent to the GPs at the end of the study informing them of their patients' progress on the diet (see Appendix M and N).

During the 12-week dietary intervention, the researcher followed up with participants via email bi-weekly to discuss how they felt about following the diets and if there were issues encountered that needed clarification. A separate email account was created primarily for this purpose to ensure confidentiality and proper handling of information divulged by participants be stored in accordance with the Data Protection Act of 1998. The email account was later discontinued at the end of the study and raw data extracted were stored in a secured filing cabinet and password protected computers during the study as per the Data Protection Act of 1998. Provision was also made for telephone support and participants were encouraged to report any side effects and discomfort to the researcher. Possible side-effects, such as headaches, tiredness, and constipation associated with the diets were highlighted. The participants in the HPLC diet group were supplemented

with multivitamins and minerals to address any potential deficiencies-related problems.

5.2.4 Data Collection

A consent form was signed by participants before any measurement was taken and after confirming they had read the information sheet provided. Demographic information of participants, including name (replaced with code to maintain confidentiality), age, and the highest level of education, employment, marital status, and ethnic origin were collected.

5.2.5 Anthropometric Measurements

Anthropometric assessment included the following metrics captured at both baseline and post-intervention (end of 12 weeks): Body Mass Index (BMI kg/m²), waist and hip circumference, and Sagittal Abdominal Diameter (SAD).

BMI was computed from weight and height measured at baseline and at the end of 12 weeks. At baseline, participants were weighed wearing light clothing and no shoes. This measurement was done using a digital scale (Seca, Frankfurt, Germany), to the nearest 0.1kg and repeated at the end of the 12 weeks. Stature was only measured at baseline and to the nearest 0.1cm using a stadiometer (Leicester Height Measure (HaB direct, UK). Participants were measured wearing no shoes and with their back to the vertical scale of the measure. Participants were instructed to inhale when in the right position and ready to be measured, then the researcher lightly provided upward traction on the jaw. At this point, the reading was recorded to the nearest 0.1cm in accordance with the International standards for anthropometric assessment (ISAK) manual (Stewart et al, 2011).

Waist and hip circumferences were both obtained using a non-extensible but flexible Lufkin W606PM anthropometric/diameter tape. For ease of comfort, the measurer approached participants from the front-side. For correct measurement of the waist circumference, participants were prompted to stand up, with feet together and their arms folded across their chest. With the flexible non-elastic tape, waist circumference was then measured at the narrowest point between the

lower costal (10th rib) border and the top of the iliac crest, perpendicular to the long axis of the trunk. In the absence of any obvious narrowing, the measurement was taken at the mid-point between the lower costal rib and the iliac crest (Stewart et al, 2011). Once the tape measure was properly positioned, participants were directed to breathe in gently and then the measurement taken after exhalation. This was repeated 2-3 times to ensure a consistent result was obtained. Measurements were read at the level of the tape to the nearest 0.1cm (Stewart et al, 2011, Frey and Fogoros, 2019).

Hip circumference was taken at the level of greatest posterior protuberance of the buttocks, perpendicular to the long axis of the trunk, with feet together (Stewart et al, 2011). Measurement were also read at the level of the tape to the nearest 0.1cm.

SAD was assessed using a Campbell 20 large sliding calliper (Rosscraft, Vancouver, Canada). As with waist circumference, sagittal diameter was measured between the top of the iliac crest and the minimal waist, at the end of a normal exhalation while the participant is relaxed and in a standing position. To measure SAD, one of the callipers was placed on the participant's back at the level of the landmark and close the other calliper until it touched the participant's abdomen, with the callipers parallel to the ground while the participant was standing. The callipers were compressed without indenting the participant's skin (Stewart et al, 2011). As with waist and hip circumference, the SAD measurement was read and recorded at 0.1cm precision.

5.3 Results

5.3.1 Participants demographics

A total of 39 women were recruited and invited for the dietary intervention stage. After screening, 6 women were excluded because of low BMI and/or absence of known obesity comorbidities. Table 5.2 shows the reasons for exclusion and discontinuation of participants from the study. Thirty-three of the women met the inclusion criteria and were randomly assigned to one of the two diets. Participants were allocated to their diets at their first visit (see Figure 5.2 for participants' flow chart for the entire dietary intervention stage):

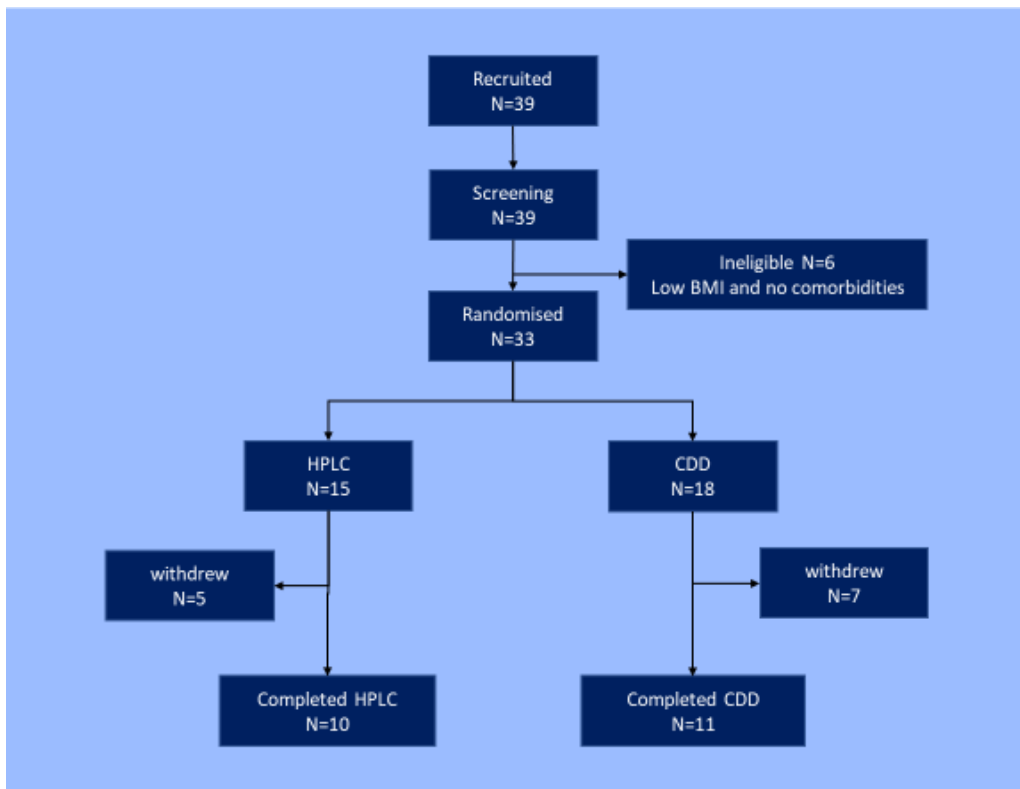


Figure 5. 2 Participants flow chart

Table 5.2 Information of excluded participants and of non-completers with reasons for discontinuing

Non-Completers Code	HPLC	CDD	BMI at baseline	DAYS on DIET	Reasons for exclusion and/or discontinuing
HPLCE1	√		35.97	7	Couldn't cope, was feeling dizzy and hungry – decided to stop.
CDDE1		√	36.39	29	Not coping with exams. Struggling to keep with the dietary regime
CDDE2		√	31.7	2	Work and family schedule stressful, unable to cope with the diet
HPLCE2	√		32.92	14	Couldn't cope with diet and academic work/examinations
ENA1			29.3	N/A	Excluded – Low BMI and no comorbidities
ENA2			28.57	N/A	Excluded – Low BMI and no comorbidities
ENA3			28.93	N/A	Excluded – Low BMI and no comorbidities
CDDE3		√	32.94	91	Found out she was pregnant
ENA4			27.10	N/A	Excluded – Low BMI and no comorbidities
ENA5			25.77	N/A	Excluded – Low BMI and no comorbidities
CDDE4		√	31.52	30	Couldn't meet up with detailing, full time job and family
ENA6			29.16	N/A	Excluded – Low BMI and no comorbidities
CDDE5		√	40.16	15	Never started the diet and only told me towards the end
HPLCE3	√		33.61	14	Ill and family challenges makes focus difficult
HPLCE4	√		30.2	37	Personal and family crisis
CDDE6		√	40.75	28	Participant confirmed she never started diet after several calls and follow up emails not returned.
HPLCE5	√		35.38	N/A	Completed diet but was not available for post data collection
CDDE7		√	31.96	N/A	Completed diet but was not available for post data collection

All the participants in this study were women of African origin, with most of them from Nigeria (n=25). The remaining eight participants were from Ghana (n=3), South Africa (n=2), with one participant from Uganda, Somalia and Malawi, respectively.

In the HPLC, group two participants were students (n=2), five in part-time employment (n=5), two in full time employment (n=2) and one self-employed (n=1). While in the CDD group, four women (n=4) were in part-time employment and three in full time employment (n=3). Four women (n=4) among the completers in the HPLC were single, six were married (n=6); while three were single in the CDD group (n=3) and eight women were married (n=8).

Table 5.3 Participants' demographics (completers)

CODE	Age Range	Highest level of education	Employment Status	Marital status	Ethnicity/Tribe
CDD01	20 to 29	Degree	Student	Single	Somalia
HPLC01	20 to 29	Masters	Student	Single	Rivers/Nigerian
HPLC02	30 to 39	Masters/PhD student	Part time job	Single	Ibo/Nigerian
HPLC03	30 to 39	Masters	Part time	Married	Ibo/Nigerian
CDD02	40 to 49	Masters	Part time	Married	Northern Nigerian
HPLC04	30 to 39	Masters/PhD student	Unemployed/full time student	Single	Northern Nigerian
CDD03	30 to 39	Degree	Full time	Married	Ibo/Nigerian
HPLC05	50 to 59	Masters	Part time employment	Married	Northern Nigerian
CDD04	40 to 49	Degree	Full time	Married	Ghanaian
CDD05	20 to 29	Masters	Unemployed – full time student	Single	Ibo/Nigerian
HPLC06	30 to 39	Primary education	Full time - Nanny	Single	Ibo/Nigerian
HPLC07	30 to 39	Degree	Self-employed	Married	Delta/Nigerian
HPLC08	30 to 39	Degree	Part time	Married	Edo/Nigerian
CDD06	30 to 39	Degree	Student	Married	Yoruba/Nigerian
HPLC09	30 to 39	Degree	Part time	Married	Ibo/Nigerian
CDD07	20 to 29	Masters	Part-time	Single	Yoruba/Nigerian
CDD08	40 to 49	Diploma	Part time	Married	South African
HPLC10	30 to 39	Masters	Full time	Married	Edo, Nigerian
CDD09	40 to 49	Diploma	Student	Married	Delta/Nigerian
CDD10	30 to 39	Degree	Part time	Married	Ibo/Nigerian
CDD11	40 to 49	Degree	Full time	Married	Zimbabwe/South African

Purple = CDD group. Green = HPLC group.

Within the non-completers group (see table 5.4), eight women were married while four women were single. Numerically, more women in the completers group were single (n=7) than in the non-completers group (n=4). Only one out of the (n=11) participants that dropped out was into full time studies. Among the remaining 10

participants, half (n=5) were in full time employment and the remaining half (n=5) were in part-time employments. Out of the 8 non- Nigerians that were enrolled into the study, only half (n=4) of them did not complete the study.

Table 5.4 Participants' demographics (non-completers)

Non-Completers Code	Age Category	Highest level of education	Employment status	Marital status	Ethnicity/Tribe
HPLCE1	40 to 49	Degree	Part time	Married	Ibo/Nigerian
CDDE1	20 to 29	Diploma	Student	Single	Malawi/Southeast Africa
CDDE2	40 to 49	Degree	Full time	Married	Ghanaian
HPLCE2	18 to 19	Degree	Part time	Single	Ghanaian
CDDE4	40 to 49	Diploma	Full time	Married	Uganda/East Africa
CDDE5	20 to 29	Degree	Part time	Married	Benin/Nigerian
HPLCE3	40 to 49	Masters	Part time	Married	Yoruba/Nigerian
HPLCE4	40 to 49	Degree	Full time	Married	Edo/Nigerian
CDDE6	30 to 39	Degree	Full time	Married	Delta/Nigerian
HPLCE5	40 to 49	Degree	Part time	Single	Ibo/Nigerian
CDDE7	30 to 39	Masters	Part time	Married	Ibo/Nigerian
CO/039	30 to 39	Primary education	Full time	Single	Ibo/Nigerian

5.3.2 Anthropometric measurements pre and post intervention (completers)

The anthropometric characteristics of participants at baseline and post intervention on a HPLC and CDD diet are shown in Tables 5.5 and 5.6, respectively. The number of women allocated to the CDD (n=18) was slightly higher than in the HPLC group (n=15). Waist circumference, hip circumference and SAD were measured in inches but converted to SI units to one decimal place.

Properties of statistical distributions (mean \pm standard deviation) for parameters, body mass, waist circumference, hip circumference, SAD and BMI at baseline for both diets are as follows. Mean mass for HPLC is 99.3kg \pm 23.6kg vs 94.6kg \pm 16.8kg for CDD; waist circumference is 103.3cm \pm 11.2cm for HPLC vs 101.4cm \pm 8.3cm for CDD; hip circumference 123.6cm \pm 12.0cm for HPLC vs 123.0cm \pm 11.6cm for CDD; SAD 33.8cm \pm 4.3cm for HPLC vs 32.5cm \pm 5.0cm for CDD . BMI was 36.8kg/m² \pm 5.8kg/m² for HPLC vs 35.1kg/m² \pm 5.4kg/m² for CDD. Figure 5.3 shows the same properties in bar charts for ease of comparison between baseline and post-intervention results. No statistical differences were observed, for all the parameters, between the two groups at baseline.

Reductions within group in the above parameters, post intervention are for body mass, 3.0 ± 4.1 kg in the HPLC and 2.3 ± 2.9 kg in the CDD group. Weight loss expressed as a percentage of start weight was on average 2.8% for the HPLC group versus 2.4% for the CDD group. The biggest losers were 9.8kg (10.3%) in HPLC group and 8.4kg (9.3%) for the CDD group (see Table 5.5 and Table 5.6).

For waist circumference, reductions were 5.8 ± 4.5 cm (6%) for HPLC and 5.3 ± 3.4 cm (5%) for CDD group; hip circumference 4.2 ± 2.7 cm (3%) for HPLC and 3.9 ± 4.2 cm (3%) for CDD; SAD 2.9 ± 1.9 cm (8%) HPLC and 2.5 ± 2.5 cm (7%) for CDD; BMI 1.02 kg/m² (3%) for HPLC vs 0.7 kg/m² (2%) for CDD (Table 5.6).

For the same parameters - weight change, waist circumference change, hip circumference change, SAD change and BMI change, an independent t-Test (Two-Sample Assuming Unequal Variances) with one independent variable (diet) was conducted (Table 5.7). In all cases, the t Stat is smaller than the t Critical two-tail, meaning that the null hypothesis cannot be rejected or that there are no statistically significant differences between the HPLC and CDD groups.

Table 5.5 Anthropometric characteristics of completers in the HPLC group before and after intervention

Dietary Group: High Protein Low Carbohydrate (HPLC)																							
BASELINE MEASUREMENTS FOR COMPLETERS							POST DIETARY MEASUREMENTS FOR COMPLETERS																
CODE	W ^{*1} (kg)	HEIGHT ¹ (m)	WC ^{*2} (cm)	HC ^{*3} (cm)	SAD ^{*4} (cm)	BMI ^{*5} (kg/m ²)	W ^{*1} (kg)	HEIGHT ¹ (m)	WC ^{*2} (cm)	HC ^{*3} (cm)	SAD ^{*4} (cm)	BMI ^{*5} (kg/m ²)	ΔW (kg) ↓ = loss; ↑ = gain	% weight loss	ΔWC	ΔWC /WC %	ΔHC	ΔHC /HPC %	ΔSAD	ΔSAD %	ΔBMI	ΔBMI %	
HPLC01	81.5	1.58	91.4	115.0	27.2	32.6	84.9	1.58	92.4	115.0	27.7	34.01	3.4	4.2%	0.9	1.0%	0.0	0.0%	0.5	1.8%	1.41	4.3%	
HPLC02	135.0	1.691	119.7	141.4	38.9	47.2	126.2	1.691	114.4	135.7	33.7	44.13	-8.8	-6.5%	-5.3	-4.5%	-5.7	-4.0%	-5.2	-13.4%	-3.07	-6.5%	
HPLC03	94.8	1.688	103.4	116.6	32.5	33.3	85.0	1.688	90.5	106.8	27.5	29.83	-9.8	-10.3%	-12.9	-12.5%	-9.7	-8.4%	-5.0	-15.4%	-3.47	-10.4%	
HPLC04	80.8	1.596	90.8	117.8	30.4	31.7	79.1	1.596	84.5	113.7	27.6	31.05	-1.7	-2.1%	-6.3	-6.9%	-4.1	-3.5%	-2.8	-9.2%	-0.65	-2.1%	
HPLC05	103.2	1.568	113.7	129.1	34.2	41.97	103.7	1.568	114.0	126.3	34.2	42.18	0.5	0.5%	0.3	0.3%	-2.8	-2.2%	0.0	0.0%	0.21	0.5%	
HPLC07	87.0	1.607	101.2	120.3	31.6	33.68	84.8	1.607	92.7	116.2	29.2	32.84	-2.2	-2.5%	-8.5	-8.4%	-4.1	-3.4%	-2.4	-7.6%	-0.84	-2.5%	
HPLC08	86.3	1.645	97.7	113.1	31.2	31.89	79.8	1.645	86.4	106.5	26.8	29.49	-6.5	-7.5%	-11.3	-11.6%	-6.6	-5.8%	-4.4	-14.1%	-2.4	-7.5%	
HPLC09	147.3	1.816	118.1	146.1	41.3	44.66	144.8	1.816	114.4	141.7	38.3	43.91	-2.5	-1.7%	-3.8	-3.2%	-4.4	-3.0%	-3.0	-7.3%	-0.75	-1.7%	
HPLC10	97.8	1.596	107.1	126.0	37.4	38.3	96.6	1.596	99.6	124.1	34.1	37.92	-1.2	-1.2%	-7.5	-7.0%	-1.9	-1.5%	-3.3	-8.8%	-0.38	-1.0%	
HPLC06	78.9	1.556	89.8	110.9	33.6	32.58	78.2	1.556	86.4	107.8	30.4	32.3	-0.7	-0.9%	-3.5	-3.8%	-3.1	-2.8%	-3.2	-9.5%	-0.28	-0.9%	

Colourcode* Green = reductions;
pink = gains

- *1 W = Weight
- *2 WC = Waist Circumference
- *3 HC = Hip Circumference
- *4 SAD = Sagittal Abdominal Diameter
- *5 BMI = Body Mass Index

Table 5.6 Anthropometric characteristics of completers in the CDD group before and after intervention

Dietary Group: Calorie Deficit Diet (CDD)																						
CODE	W ^{*1} (kg)	HEIGHT(m)	WC ^{*2} (cm)	HC ^{*3} (cm)	SAD ^{*4} (cm)	BMI ^{*5} (kg/m ²)	W ^{*1} (kg)	HEIGHT(m)	WC ^{*2} (cm)	HC ^{*3} (cm)	SAD ^{*4} (cm)	BMI ^{*5} (kg/m ²)	ΔW (kg) ↓ = loss; ↑ = gain	% weight loss	ΔWC	ΔWC /WC %	ΔHC	ΔHC /HPC %	ΔSAD	ΔSAD %	ΔBMI	ΔBMI %
CDD01	90.2	1.635	94.2	119.4	27.6	33.70	81.8	1.635	91.1	107.1	26.0	30.6	-8.4	-9.3%	-3.1	-3.3%	-12.3	-10.3%	-1.6	-5.8%	-3.10	-9.2%
CDD02	83.0	1.627	101.8	110.9	35.4	31.30	79.9	1.627	90.2	108.4	30.2	30.18	-3.1	-3.7%	-11.6	-11.4%	-2.5	-2.3%	-5.2	-14.7%	-1.12	-3.6%
CDD03	97.9	1.676	102.1	125.3	29.1	34.80	95.5	1.676	95.8	123.5	26.9	34	-2.4	-2.5%	-6.3	-6.2%	-1.9	-1.5%	-2.2	-7.6%	-0.80	-2.3%
CDD04	89.3	1.684	96.8	114.7	29.0	31.40	86.0	1.684	90.8	110.9	26.6	30.33	-3.3	-3.7%	-6.0	-6.2%	-3.8	-3.3%	-2.4	-8.3%	-1.07	-3.4%
CDD05	88.5	1.701	90.2	114.0	26.1	30.62	86.8	1.701	88.3	114.4	26.3	30	-1.7	-1.9%	-1.9	-2.1%	0.3	0.3%	0.2	0.8%	-0.62	-2.0%
CDD06	84.7	1.584	94.2	123.2	32.3	33.75	85.3	1.584	91.1	121.6	30.1	34	0.6	0.7%	-3.1	-3.3%	-1.6	-1.3%	-2.2	-6.8%	0.25	0.7%
CDD07	136.2	1.776	119.1	140.7	40.1	43.10	131.2	1.776	109.6	132.3	33.5	41.6	-5	-3.7%	-9.4	-7.9%	-8.5	-6.0%	-6.6	-16.5%	-1.50	-3.5%
CDD08	104.2	1.659	106.2	134.1	37.1	37.10	106.2	1.659	106.5	134.5	37.3	38.59	2	1.9%	0.3	0.3%	0.3	0.2%	0.2	0.5%	1.49	4.0%
CDD09	84.2	1.594	98.0	121.0	30.3	33.10	85.0	1.594	94.6	117.2	30.2	33.45	0.8	1.0%	-3.5	-3.5%	-3.8	-3.1%	-0.1	-0.3%	0.35	1.1%
CDD10	74.7	1.565	102.4	107.4	30.1	30.50	73.3	1.565	95.8	107.4	29.0	29.93	-1.4	-1.9%	-6.6	-6.4%	0.0	0.0%	-1.1	-3.7%	-0.57	-1.9%
CDD11	107.9	1.512	110.6	141.7	40.7	47.19	104.9	1.512	104.0	132.6	34.3	45.89	-3	-2.8%	-6.6	-6.0%	-9.1	-6.4%	-6.4	-15.7%	-1.30	-2.8%

Colourcode* Green=reductions;

pink= gains

*1 W = Weight

*2 WC = WaistCircumference

*3 HC = HipCircumference

*4 SAD = Sagittal Abdominal Diameter

*5 BMI = Body Mass Index

Table 5.7 Independent t-Test Statistical Analysis Results

ΔWeight Loss		
	HPLC	CDD
	3.4	-8.4
	-8.8	-3.1
	-9.8	-2.4
	-1.7	-3.3
	0.5	-1.7
	-2.2	0.6
	-6.5	-5
	-2.5	2
	-1.2	0.8
	-0.7	-1.4
		-3

ΔWaist Circumference		
	HPLC	CDD
	0.9	-3.1
	-5.3	-11.6
	-12.9	-6.3
	-6.3	-6.0
	0.3	-1.9
	-8.5	-3.1
	-11.3	-9.4
	-3.8	0.3
	-7.5	-3.5
	-3.5	-6.6
		-6.6

ΔHip Circumference		
	HPLC	CDD
	0.0	-12.3
	-5.7	-2.5
	-9.7	-1.9
	-4.1	-3.8
	-2.8	0.3
	-4.1	-1.6
	-6.6	-8.5
	-4.4	0.3
	-1.9	-3.8
	-3.1	0.0
		-9.1

t-Test: Two-Sample Assuming Unequal Variances

	HPLC	CDD
Mean	-2.95	-2.26
Variance	17.38	8.43
Observations	10	11
Hypothesized Mean Difference	0	
df	16	
t Stat	-0.43371	
P(T<=t) one-tail	0.335146	
t Critical one-tail	1.745884	
P(T<=t) two-tail	0.670292	
t Critical two-tail	2.119905	

t-Test: Two-Sample Assuming Unequal Variances

	HPLC	CDD
Mean	-5.78	-5.26
Variance	20.40	11.77
Observations	10	11
Hypothesized Mean Difference	0	
df	17	
t Stat	-0.29799	
P(T<=t) one-tail	0.38466	
t Critical one-tail	1.739607	
P(T<=t) two-tail	0.769319	
t Critical two-tail	2.109816	

t-Test: Two-Sample Assuming Unequal Variances

	HPLC	CDD
Mean	-4.24	-3.88
Variance	7.18	18.01
Observations	10	11
Hypothesized Mean Difference	0	
df	17	
t Stat	-0.23264	
P(T<=t) one-tail	0.409408	
t Critical one-tail	1.739607	
P(T<=t) two-tail	0.818816	
t Critical two-tail	2.109816	

Δ SAD		
	HPLC	CDD
	0.5	-1.6
	-5.2	-5.2
	-5	-2.2
	-2.8	-2.4
	0	0.2
	-2.4	-2.2
	-4.4	-6.6
	-3	0.2
	-3.3	-0.1
	-3.2	-1.1
		-6.4

Δ BMI		
	HPLC	CDD
	1.41	-3.1
	-3.07	-1.12
	-3.47	-0.8
	-0.65	-1.07
	0.21	-0.62
	-0.84	0.25
	-2.4	-1.5
	-0.75	1.49
	-0.38	0.35
	-0.28	-0.57
		-1.3

t-Test: Two-Sample Assuming Unequal Variances

	HPLC	CDD
Mean	-2.88	-2.49
Variance	3.60	6.26
Observations	10	11
Hypothesized Mean Difference	0	
df	18	
t Stat	-0.40356	
P(T<=t) one-tail	0.345645	
t Critical one-tail	1.734064	
P(T<=t) two-tail	0.691289	
t Critical two-tail	2.100922	

t-Test: Two-Sample Assuming Unequal Variances

	HPLC	CDD
Mean	-1.02	-0.73
Variance	2.30	1.39
Observations	10	11
Hypothesized Mean Difference	0	
df	17	
t Stat	-0.49503	
P(T<=t) one-tail	0.313458	
t Critical one-tail	1.739607	
P(T<=t) two-tail	0.626916	
t Critical two-tail	2.109816	

Although the t-Test (Table 5.7) shows no statistically significant difference between the diets, differences exist between the pre and post intervention measurements. These differences in basic statistical calculations (mean, min, max and standard variation) for participants of the HPLC and CDD diets are shown in figures 5.3 and 5.4 below.



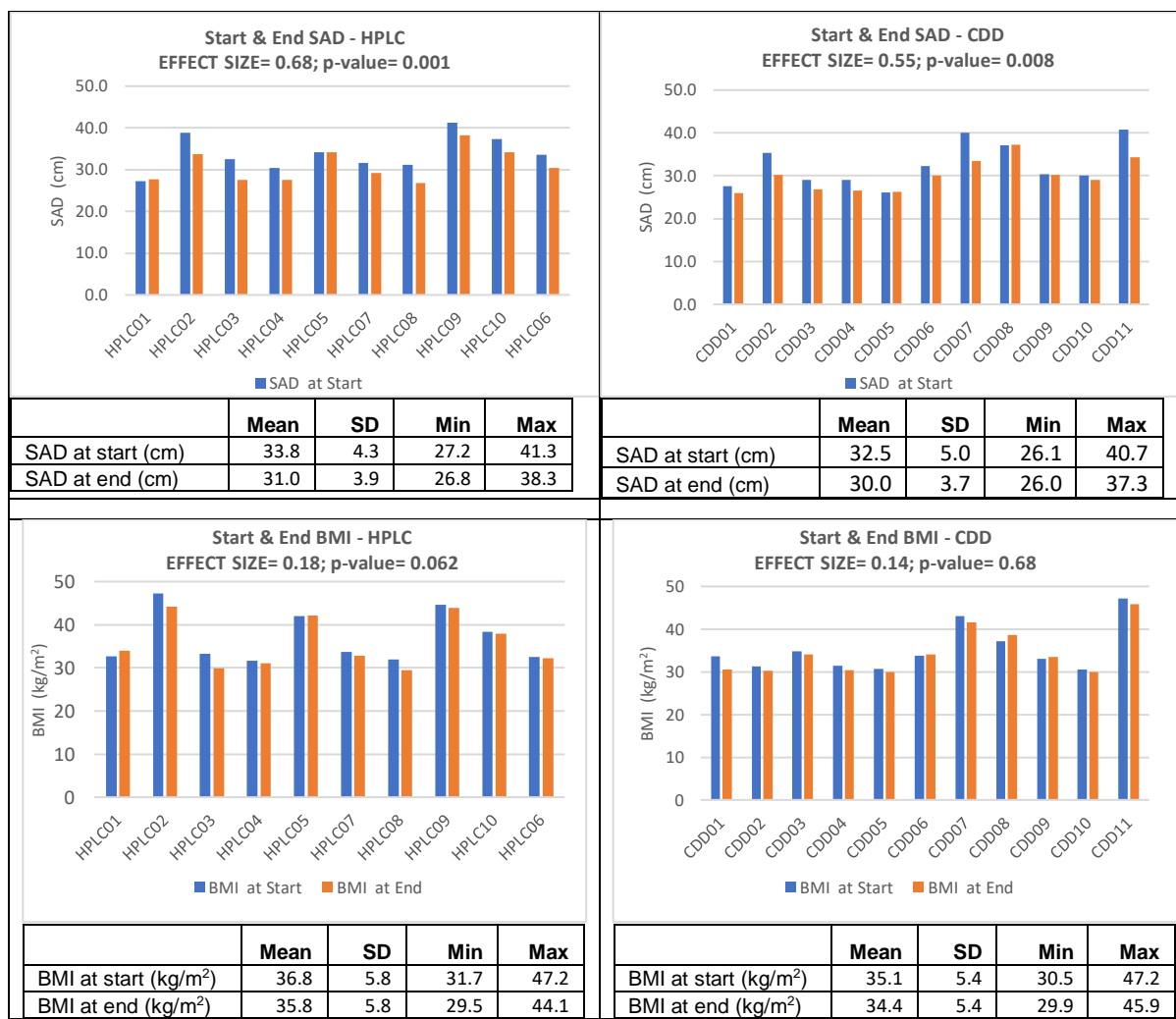


Figure 5. 3 Participants' key measurements and BMI at baseline and post intervention

Table 5.8 Changes for all parameters during intervention

	HPLC				CDD			
	Mean	SD	Min	Max	Mean	SD	Min	Max
weight change (kg)	-3.0	4.2	-9.8	3.4	-2.3	2.9	-8.4	2.0
waist circ change (cm)	-5.8	4.5	-12.9	0.9	-5.3	3.4	-11.6	0.3
hip circ change (cm)	-4.2	2.7	-9.7	0.0	-3.9	4.2	-12.3	0.3
SAD change (cm)	-2.9	1.9	-5.2	0.5	-2.5	2.5	-6.6	0.2
BMI change (kg/m ²)	-1.0	1.5	-3.5	1.4	-0.7	1.2	-3.1	1.5

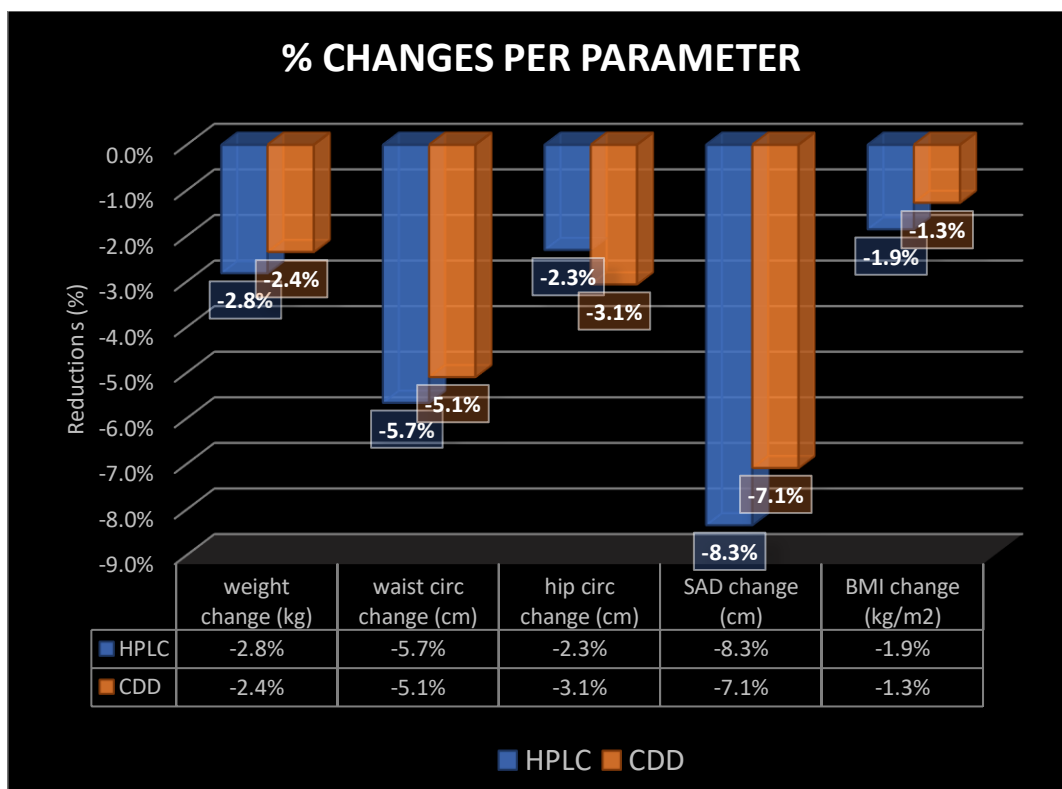


Figure 5. 4 Changes for key parameters during intervention (Visceral fat change)

5.3.3 Attrition Rate and Intention to Treat Analysis

The attrition rate did not differ significantly between the two groups (HPLC: 5 out of 15; CDD: 7 out of 18). The most common reasons for discontinuing the study in the HPLC group was personal, work, and family related stress and challenges (3 of 5), feeling of dizziness and hunger (1 of 5), and failure to return for post intervention data collect (1 of 5). For the CDD group, the most common reasons for discontinuing the diets were inability to cope with the dietary regime (2 of 7), pregnancy (1 of 7), work and family commitments (1 of 7), never started the diet after being assigned (2 of 7), and failure to return for post intervention data collection (1 of 7).

When the measurements for non-completers are included in baseline and carried forward, the properties of statistical distributions (mean \pm standard deviation) for parameters, body mass, waist circumference, hip circumference, SAD and BMI are different compared to when these are computed for completers alone. The values at baseline for both diets are as follows. Mean mass for HPLC is 97.0 ± 19.6 kg vs 94.6 ± 14.2 kg for CDD; waist circumference is 103.2 ± 9.8 cm for HPLC vs 101.0 ± 8.2 cm for CDD; hip circumference 121.4 ± 10.2 cm for HPLC vs 122.7 ± 10.3 cm for CDD; SAD 32.9 ± 4.0 cm for HPLC vs 32.1 ± 4.7 cm for CDD. BMI was 35.5 ± 5.1 kg/m² for HPLC vs 35.1 ± 4.7 kg/m² for CDD. Table 5.11 summarises this

information in tabular form.

Reductions within group in the above parameters, post intervention are for body mass, 2.0 ± 3.5 kg in the HPLC and 1.5 ± 2.4 kg in the CDD group. Weight loss expressed as a percentage of start weight was on average 1.9% for the HPLC group versus 1.6% for the CDD group. The biggest losers were 9.8kg (10.3%) in HPLC group and 8.4kg (9.3%) for the CDD group (see Tables 5.9 and 5.10).

For waist circumference, reductions were 3.9 ± 4.4 cm (3.8%) for HPLC and 3.2 ± 3.6 cm (3.1%) for CDD group; hip circumference 2.8 ± 2.9 cm (2.3%) for HPLC and 2.4 ± 3.7 cm (1.9%) for CDD; SAD 1.9 ± 2.0 cm (5.6%) for HPLC and 1.5 ± 2.2 cm (4.3%) for CDD; BMI 0.68 kg/m² (1.9%) for HPLC vs 0.44 kg/m² (1.3%) for CDD (Table 5.11).

For the same parameters - weight change, waist circumference change, hip circumference change, SAD change and BMI change, similar to the analysis for completers, an independent t-Test (Two-Sample Assuming Unequal Variances) with one independent variable (diet) was conducted (Table 5.12). In all cases, the t Stat is smaller than the t Critical two-tail, meaning that the null hypothesis cannot be rejected or that there are no statistically significant differences between the HPLC and CDD groups. However, the mean loses for each parameter differed between groups (table 5.9).

Within groups however, most participants achieved weight, waist circumference, hip circumference, SAD and BMI reductions after intervention as shown in table 5.11.

Table 5.9 BOCF (Base observation carried forward) Analysis - HPLC

Dietary Group: High Protein Low carbohydrate (HPLC)																						
BASELINE MEASUREMENTS FOR COMPLETERS							POST DIETARY MEASUREMENTS FOR COMPLETERS															
CODE	W ^{*1} (kg)	HEIGHT T (m)	WC ^{*2} (cm)	HC ^{*3} (cm)	SAD ^{*4} (cm)	BMI ^{*5} (kg/m ²)	W ^{*1} (kg)	HEIGHT (m)	WC (cm)	HC (cm)	SAD (cm)	BMI (kg/m ²)	ΔW (kg) '- = loss; '+ = gain	% weight loss	ΔWC	ΔWC %	ΔHC	ΔHC /HPC %	ΔSAD	ΔSAD %	ΔBMI	ΔBMI %
HPLC01	81.5	1.58	91.4	115.0	27.2	32.60	84.9	1.58	92.4	115.0	27.7	34.01	3.4	4.2%	0.9	1.0%	0.0	0.0%	0.5	1.8%	1.41	4.3%
HPLC02	135.0	1.69	119.7	141.4	38.9	47.20	126.2	1.69	114.4	135.7	33.7	44.13	-8.8	-6.5%	-5.3	-4.5%	-5.7	-4.0%	-5.2	-13.4%	-3.07	-6.5%
HPLC03	94.8	1.69	103.4	116.6	32.5	33.30	85.0	1.69	90.5	106.8	27.5	29.83	-9.8	-10.3%	-12.9	-12.5%	-9.7	-8.4%	-5.0	-15.4%	-3.47	-10.4%
HPLC04	80.8	1.60	90.8	117.8	30.4	31.70	79.1	1.60	84.5	113.7	27.6	31.05	-1.7	-2.1%	-6.3	-6.9%	-4.1	-3.5%	-2.8	-9.2%	-0.65	-2.1%
HPLC05	103.2	1.57	113.7	129.1	34.2	41.97	103.7	1.57	114.0	126.3	34.2	42.18	0.5	0.5%	0.3	0.3%	-2.8	-2.2%	0.0	0.0%	0.21	0.5%
HPLC07	87.0	1.61	101.2	120.3	31.6	33.68	84.8	1.61	92.7	116.2	29.2	32.84	-2.2	-2.5%	-8.5	-8.4%	-4.1	-3.4%	-2.4	-7.6%	-0.84	-2.5%
HPLC08	86.3	1.65	97.7	113.1	31.2	31.89	79.8	1.65	86.4	106.5	26.8	29.49	-6.5	-7.5%	-11.3	-11.6%	-6.6	-5.8%	-4.4	-14.1%	-2.40	-7.5%
HPLC09	147.3	1.82	118.1	146.1	41.3	44.66	144.8	1.82	114.4	141.7	38.3	43.91	-2.5	-1.7%	-3.8	-3.2%	-4.4	-3.0%	-3.0	-7.3%	-0.75	-1.7%
HPLC10	97.8	1.60	107.1	126.0	37.4	38.30	96.6	1.60	99.6	124.1	34.1	37.92	-1.2	-1.2%	-7.5	-7.0%	-1.9	-1.5%	-3.3	-8.8%	-0.38	-1.0%
HPLC06	78.9	1.56	89.8	110.9	33.6	32.59	78.2	1.56	86.4	107.8	30.4	32.3	-0.7	-0.9%	-3.5	-3.8%	-3.1	-2.8%	-3.2	-9.5%	-0.29	-0.9%
HPLCE1	110.9	1.76	107.8	124.1	35.1	35.97	110.9	1.76	107.8	124.1	35.1	35.97	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
HPLCE2	85.2	1.69	95.2	113.1	27.1	29.83	85.2	1.69	95.2	113.1	27.1	29.83	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
HPLCE3	82.1	1.56	110.6	114.7	32.6	33.61	82.1	1.56	110.6	114.7	32.6	33.61	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
HPLCE4	84.9	1.67	92.0	112.2	27.7	30.30	84.9	1.67	92.0	112.2	27.7	30.3	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
HPLCE5	99.5	1.68	109.6	121.3	32.4	35.38	99.5	1.68	109.6	121.3	32.4	35.38	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%

Colour code"

Green = reductions;

pink = gains

- *1 W = Weight
- *2 WC = WaistCircumference
- *3 HC = HipCircumference
- *4 SAD = Sagittal Abdominal Diameter
- *5 BMI = Body Mass Index

Table 5.10 BOCF (Base observation carried forward) Analysis – CDD

Dietary Group: Calorie Deficit Diet (CDD)																						
BASELINE MEASUREMENTS FOR COMPLETERS							POST DIETARY MEASUREMENTS FOR COMPLETERS															
CODE	W* ¹ (kg)	HEIGHT T (m)	WC* ² (cm)	HC* ³ (cm)	SAD* ⁴ (cm)	BMI* ⁵ (kg/m ²)	W* ¹ (kg)	HEIGHT (m)	WC (cm)	HC (cm)	SAD (cm)	BMI (kg/m ²)	ΔW (kg) '- = loss; '+	% weight loss	ΔWC	ΔWC /WC %	ΔHC	ΔHC /HPC %	ΔSAD	ΔSAD %	ΔBMI	ΔBMI %
CDD01	90.2	1.64	94.2	119.4	27.6	33.70	81.8	1.64	91.1	107.1	26.0	30.6	-8.4	-9.3%	-3.1	-3.3%	-12.3	-10.3%	-1.6	-5.8%	-3.10	-9.2%
CDD02	83.0	1.63	101.8	110.9	35.4	31.30	79.9	1.63	90.2	108.4	30.2	30.18	-3.1	-3.7%	-11.6	-11.4%	-2.5	-2.3%	-5.2	-14.7%	-1.12	-3.6%
CDD03	97.9	1.68	102.1	125.3	29.1	34.80	95.5	1.68	95.8	123.5	26.9	34	-2.4	-2.5%	-6.3	-6.2%	-1.9	-1.5%	-2.2	-7.6%	-0.80	-2.3%
CDD04	89.3	1.68	96.8	114.7	29.0	31.40	86.0	1.68	90.8	110.9	26.6	30.33	-3.3	-3.7%	-6.0	-6.2%	-3.8	-3.3%	-2.4	-8.3%	-1.07	-3.4%
CDD05	88.5	1.70	90.2	114.0	26.1	30.62	86.8	1.70	88.3	114.4	26.3	30	-1.7	-1.9%	-1.9	-2.1%	0.3	0.3%	0.2	0.8%	-0.62	-2.0%
CDD06	84.7	1.58	94.2	123.2	32.3	33.75	85.3	1.58	91.1	121.6	30.1	34	0.6	0.7%	-3.1	-3.3%	-1.6	-1.3%	-2.2	-6.8%	0.25	0.7%
CDD07	136.2	1.78	119.1	140.7	40.1	43.10	131.2	1.78	109.6	132.3	33.5	41.6	-5.0	-3.7%	-9.4	-7.9%	-8.5	-6.0%	-6.6	-16.5%	-1.50	-3.5%
CDD08	104.2	1.66	106.2	134.1	37.1	37.10	106.2	1.66	106.5	134.5	37.3	38.59	2.0	1.9%	0.3	0.3%	0.3	0.2%	0.2	0.5%	1.49	4.0%
CDD09	84.2	1.59	98.0	121.0	30.3	33.10	85.0	1.59	94.6	117.2	30.2	33.45	0.8	1.0%	-3.5	-3.5%	-3.8	-3.1%	-0.1	-0.3%	0.35	1.1%
CDD10	74.7	1.57	102.4	107.4	30.1	30.50	73.3	1.57	95.8	107.4	29.0	29.93	-1.4	-1.9%	-6.6	-6.4%	0.0	0.0%	-1.1	-3.7%	-0.57	-1.9%
CDD11	107.9	1.51	110.6	141.7	40.7	47.20	104.9	1.51	104.0	132.6	34.3	45.89	-3.0	-2.8%	-6.6	-6.0%	-9.1	-6.4%	-6.4	-15.7%	-1.31	-2.8%
CDDE1	97.4	1.64	100.8	122.8	34.3	36.39	97.4	1.64	100.8	122.8	34.3	36.39	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
CDDE2	78.0	1.57	98.0	111.5	31.4	31.70	78.0	1.57	98.0	111.5	31.4	31.7	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
CDDE3	94.2	1.69	100.8	116.2	29.3	32.94	94.2	1.69	100.8	116.2	29.3	32.94	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
CDDE4	87.6	1.67	89.5	114.7	26.9	31.52	87.6	1.67	89.5	114.7	26.9	31.52	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
CDDE5	110.8	1.66	114.7	126.9	36.7	40.60	110.8	1.66	114.7	126.9	36.7	40.6	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
CDDE6	107.6	1.63	108.4	140.4	37.6	40.75	104.9	1.63	108.4	140.4	37.6	40.75	-2.7	-2.5%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%
CDDE7	87.0	1.65	89.5	123.8	24.6	31.98	87.0	1.65	89.5	123.8	24.6	31.98	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.00	0.0%

Colour code* Green = reductions; pink = gains

- *1 W = Weight
- *2 WC = Waist Circumference
- *3 HC = Hip Circumference
- *4 SAD = Sagittal Abdominal Diameter
- *5 BMI = Body Mass Index

Table 5.11 Pre and post-intervention measurement and percentage changes with BOCF

	HPLC Group				CDD Group			
	Mean	SD	Min	Max	Mean	SD	Min	Max
weight at start	97.0	19.6	78.9	147.3	94.6	14.2	74.7	136.2
weight at end	95.0	18.7	78.2	144.8	93.1	13.8	73.3	131.2
weight change	-2.0	3.5	-9.8	3.4	-1.5	2.4	-8.4	2.0
weight change %	-2%	4%	-10%	4%	-2%	3%	-9%	2%
waist circ start	103.2	9.8	89.8	119.7	101.0	8.2	89.5	119.1
waist circ end	99.4	10.9	84.5	114.4	97.8	7.9	88.3	114.7
waist circ change	-3.9	4.4	-12.9	0.9	-3.2	3.6	-11.6	0.3
waist circ change %	-4%	4%	-12%	1%	-3%	3%	-11%	0%
hip circ start	121.4	10.2	110.9	146.1	122.7	10.3	107.4	141.7
hip circ end	118.6	10.0	106.5	141.7	120.3	9.8	107.1	140.4
hip circ change	-2.8	2.9	-9.7	0.0	-2.4	3.7	-12.3	0.3
hip circ change %	-2%	2%	-8%	0%	-2%	3%	-10%	0%
SAD start	32.9	4.0	27.1	41.3	32.1	4.7	24.6	40.7
SAD end	31.0	3.5	26.8	38.3	30.6	4.0	24.6	37.6
SAD change	-1.9	2.0	-5.2	0.5	-1.5	2.2	-6.6	0.2
SAD change %	-6%	6%	-15%	2%	-4%	6%	-16%	1%
BMI start	35.53	5.07	29.83	47.20	35.14	4.68	30.50	47.20
BMI end	34.85	4.90	29.49	44.13	34.69	4.69	29.93	45.89
BMI change	-0.68	1.27	-3.47	1.41	-0.44	0.95	-3.10	1.49
BMI change %	-2%	4%	-10%	4%	-1%	3%	-9%	4%

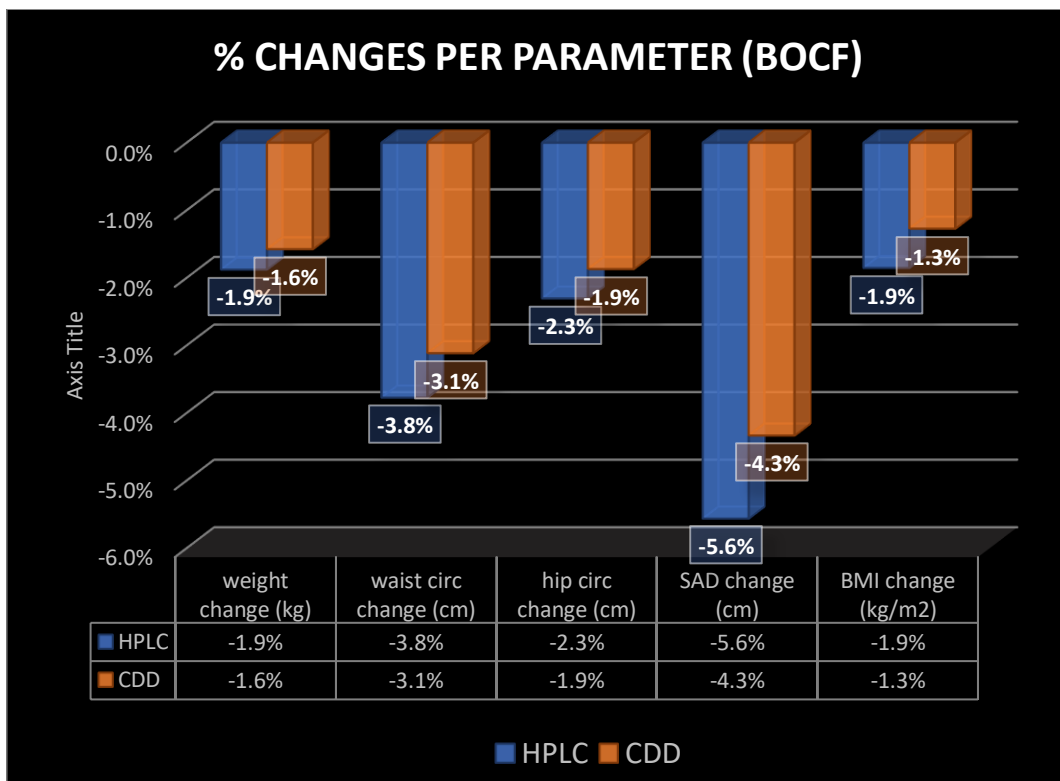


Figure 5. 5 Changes for key parameters during intervention (BOCF)

Table 5.12 t-Test Analysis of key parameters inc non-completers

ΔWeight Loss	HPLC	CDD
	3.4	-8.4
	-8.8	-3.1
	-9.8	-2.4
	-1.7	-3.3
	0.5	-1.7
	-2.2	0.6
	-6.5	-5
	-2.5	2
	-1.2	0.8
	-0.7	-1.4
	0	-3
	0	0
	0	0
	0	0
	0	0
	0	0
		0
		0
		0

	HPLC	CDD
Mean	-1.97	-1.38
Variance	13.25	6.25
Observations	15	18
Hypothesized Mean Difference	0	
df	24	
t Stat	-0.52594	
P(T<=t) one-tail	0.301878	
t Critical one-tail	1.710882	
P(T<=t) two-tail	0.603756	
t Critical two-tail	2.063899	

ΔWaist Circumference	HPLC	CDD
	0.9	-3.1
	-5.3	-11.6
	-12.9	-6.3
	-6.3	-6.0
	0.3	-1.9
	-8.5	-3.1
	-11.3	-9.4
	-3.8	0.3
	-7.5	-3.5
	-3.5	-6.6
	0.0	-6.6
	0.0	0.0
	0.0	0.0
	0.0	0.0
	0.0	0.0
	0.0	0.0
		0.0
		0.0
		0.0

	HPLC	CDD
Mean	-3.85	-3.21
Variance	21.07	13.87
Observations	15	18
Hypothesized Mean Difference	0	
df	27	
t Stat	-0.43548	
P(T<=t) one-tail	0.333339	
t Critical one-tail	1.703288	
P(T<=t) two-tail	0.666679	
t Critical two-tail	2.051831	

ΔHip Circumference	HPLC	CDD
	0.0	-12.3
	-5.7	-2.5
	-9.7	-1.9
	-4.1	-3.8
	-2.8	0.3
	-4.1	-1.6
	-6.6	-8.5
	-4.4	0.3
	-1.9	-3.8
	-3.1	0.0
	0.0	-9.1
	0.0	0.0
	0.0	0.0
	0.0	0.0
	0.0	0.0
	0.0	0.0
		0.0
		0.0
		0.0

	HPLC	CDD
Mean	-2.83	-2.37
Variance	8.90	14.39
Observations	15	18
Hypothesized Mean Difference	0	
df	31	
t Stat	-0.38455	
P(T<=t) one-tail	0.351598	
t Critical one-tail	1.695519	
P(T<=t) two-tail	0.703197	
t Critical two-tail	2.039513	

Δ SAD	HPLC	CDD
	0.5	-1.6
	-5.2	-5.2
	-5.0	-2.2
	-2.8	-2.4
	0.0	0.2
	-2.4	-2.2
	-4.4	-6.6
	-3.0	0.2
	-3.3	-0.1
	-3.2	-1.1
	0.0	-6.4
	0.0	0.0
	0.0	0.0
	0.0	0.0
	0.0	0.0
	0.0	0.0
		0.0
		0.0
		0.0

Δ BMI	HPLC	CDD
	1.41	-3.10
	-3.07	-1.12
	-3.47	-0.80
	-0.65	-1.07
	0.21	-0.62
	-0.84	0.25
	-2.40	-1.50
	-0.75	1.49
	-0.38	0.35
	-0.28	-0.57
	0.00	-1.30
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
		0.00
		0.00
		0.00

	HPLC	CDD
Mean	-1.92	-1.52
Variance	4.29	5.24
Observations	15	18
Hypothesized Mean Difference	0	
df	31	
t Stat	-0.52346	
P(T<=t) one-tail	0.302189	
t Critical one-tail	1.695519	
P(T<=t) two-tail	0.604379	
t Critical two-tail	2.039513	

	HPLC	CDD
Mean	-0.68	-0.44
Variance	1.73	0.95
Observations	15	18
Hypothesized Mean Difference	0	
df	25	
t Stat	-0.57917	
P(T<=t) one-tail	0.283828	
t Critical one-tail	1.708141	
P(T<=t) two-tail	0.567656	
t Critical two-tail	2.059539	

5.4 Discussion

This feasibility study investigated the effectiveness and acceptability of a standard low-fat, reduced energy diet (CDD) and a high protein low carbohydrate (HPLC) in obese African women in diaspora. The results from this study suggest that obese women of African descent living in NE Scotland, randomly assigned to one of two dietary approaches, had similar weight loss over a 12-week period (2.4% CDD vs. 2.8% HPLC). Weight change on both diets were either borderline (CDD, $p=0.027$) or not significant (HPLC, $p=0.052$), resulting to no changes in BMI ($p>0.05$). However, there were significant changes in shape parameters (e.g. waist, hip and SAD; $p<0.05$) of participants in both dietary groups after intervention.

The resulting weight loss for both groups likely resulted primarily from reduced energy intake, although, the mechanism of reducing energy intake varied between the two diets. The CDD group received advice to restrict fat and energy (calorie) intake while the HPLC group were counselled to restrict carbohydrates intake but not energy. The intake restriction of participants in HPLC group may have occurred due to limited food choices, or the high-protein diet may have appetite suppressant properties (Johnstone 2008; Martin et al, 2011; Hu, 2016).

Overall, participants on both diets achieved mean weight loss of approximately 3kg for HPLC and 2.3kg for CDD group, with the participants in HPLC group's mean weight loss slightly higher than that of the CDD group. Although some weight loss occurred, only four participants, three from HPLC (10.3%, 7.5% and 6.5%) and one participant from CDD (9.3%) were able to achieve a weight loss of more than 5% of their baseline weight.

However, the mean weight loss observed in this study was much less than those reported in previous studies (Samaha et al 2003; Sondike et al 2003; Brinkworth et al 2004; Krebs et al 2010 and Tobias et al 2015); where greater weight loss was reported with a low carbohydrate intake than a low-fat, high carbohydrate diet (Tobias et al 2015; Stern, Samaha et al 2004.)

It is vital to note that the characteristics of the study participants in the above-mentioned studies were different from that of the participants in this study.

Samaha et al's (2003) study compared a low carbohydrate vs. low-fat diet on

severely obese individuals presenting metabolic syndrome or T2D, with mean BMI of 43 for duration of 6 months. A higher mean weight loss among the low carbohydrate group was reported (mean, -5.8 ± 8.6 kg vs. -1.9 ± 4.2 kg). It is possible that the higher weight loss observed among Samaha et al's participants were as a result of higher BMI at baseline, hence losing more weight, as well as the longer duration of weight loss.

In contrast, Sondike et al's (2003) investigated the effect of a low carbohydrate diet on weight loss and cardiovascular risk factors in overweight adolescents. Although Sondike et al's study shares some similarity with this present study in terms of time duration for the intervention (12-weeks duration), with the low carbohydrate group losing more weight than the low-fat group, the reported mean weight loss was significantly higher in Sondike's study (mean, 9.9 ± 9.3 kg vs 4.1 ± 4.9 kg, $P < .05$). It can be argued that the findings from this study are consistent with Sondike's study, albeit to a different degree, however a notable observation was Sondike et al's prescription of exercises to their participants, which was not the case in this study. Although Sondike did not document the exercise carried out in each group, the inclusion of exercises in their study may have influenced the energy expenditure and thus, the differences in outcome.

A consistent trend between this present study and that of Samaha et al (2004) was observed. Samaha argued that the greater weight loss in the low-carbohydrate group might be a result of reduction in overall calorie intake, rather than a direct effect of macronutrient composition (Samaha et al 2003). However, the explanation for the difference in this study is not clear and may also be attributed to the participants' struggle to adhere to their dietary regime due to the barriers reported during the post-intervention interviews (discussed in detail in Chapter 6).

Although, Samaha et al's study included a high proportion of black subjects (77 black participants out of 132 total participants), their findings however revealed that black participants' overall weight loss was smaller than that of their Caucasian counterparts (Samaha et al 2003). Similarly, Schlicht and Haglund's (2015) evidence-based review included four other systematic reviews (Fitzgibbon et al 2012; Tussing-Humphreys, Fitzgibbon and Odoms-Young 2013; Walker and

Gordon 2014; Osei-Assibey and Boachie 2012) to determine if black women's participation in weight loss interventions resulted in successful weight loss compared with a usual care or control group, revealing mixed findings.

In this study, it may be plausible to presume that some of the participants in the HPLC group did not in fact adhere to the dietary regime but reverted to a low-calorie approach, as they could not cope with the dietary regime of the HPLC (some of which were highlighted in Chapter 6). This may explain why they had similar weight losses to participants on the CDD, suggesting that a low calorie/low fat (CDD) approach may be better suited for these women.

5.4.1 Randomisation and Intent-to-treat Analysis

Randomised controlled trials (RCTs) remain the gold standard for providing unbiased estimates and tests of the causal effects of obesity treatment and prevention strategies (Kaiser et al 2012). However, it is often associated with high attrition and subsequent challenge of missing data due to drop-out of participants (Elobeid et al 2009; Kaiser et al 2012). This is in part, because of participants' random assignment to a diet that might be unsuitable for their lifestyle, eating preferences and family circumstances, hence inducing demotivation that often lead to dropout. Although this study was not a typical RCT, due to the fact there was no control group, participants were however randomly assigned to their different dietary groups.

In the primary analysis of RCTs or similar dietary studies, many methodologies and regulatory bodies concur/echo that it should be done on intent-to-treat (ITT) basis. ITT as a statistical method accommodates missing data by using all available data to estimate and evaluate treatment outcome (Gadbury, Coffey and Allison 2003; National Research Council 2010). In other words, all participants randomised into the study are included in the analysis, together with those that dropped out (Kaiser et al 2012).

Although the ITT principal is generally regarded as an apt bedrock for primary analyses, several researchers resort to use of a complete case (CC) analysis,

associated with significant bias in tests and estimates of treatment effects when there are dropouts (Gadbury, Coffey and Allison 2003; National Research Council 2010).

Other popular approaches of ITT analysis are in the form of last observation carried forward (LOCF) or baseline observation carried forward (BOCF). In this present study, the primary analysis performed were on the 33 participants using the BOCF method to manage cases of dropout. However, the completers' analysis was also performed, although the sample size was small (n=21).

Several authors are in favour of the use of BOCF as a method of ITT analysis (Shao, Jordan and Pritchett 2009; Ware 2003; Kenward and Molenberghs 2009) over LOCF which is criticized for overestimation of treatment effect of an intervention as well as underestimation the sample's variability (Liu-Seifert et al 2010) due to its assumption that there is no change overtime with the last captured values of participants carried forward (Saha and Jones 2009; Shoop 2015).

Unlike the LOCF, where the last documented value of participants is carried forward, the BOCF uses the baseline value as variables for participants with no post-baseline outcome measurement, at the end of the study. While in support of BOCF as a plausible lower bound point estimate on treatment effect (Shao and Jordan 2009), other advocates sound a caution that BOCF is only rigidly logical under the assumption that participants who dropped out maintain the baseline value of the outcome measure (Kaiser et al 2012).

5.4.2 Attrition Rate

The dropout rate (30%) in this study is similar to that reported in Samaha et al's (2003) study. However, in the CDD group, the dropout rate was slightly lower (26%). The attrition rate observed in this study is within the 30% and 60% range identified by Dansinger et al (2005) as common within RCTs. Similar studies have also reported that elevated attrition rates in dietary interventions are widespread and span between participants were not obligated to provide reasons for suspending the study; however, most of the participants provided reasons for discontinuation (Table 5.2 outlines the reasons for discontinuation).

Common reasons identified such as participants' struggle and inability to adapt to the new dietary regimen and restrictions, were consistent to those provided by previous studies. This finding is particularly interesting as this seems to be a reoccurring theme and might offer insight into the 'why' (adherence and acceptability question) behind the withdrawal or even the lower than usual mean weight loss achieved in this study. It is also an indication of participants' commitments, readiness or lack of it, to embark on a lifestyle change of this sort. There were also indications that pressures from family and work commitments, personal crisis and other significant events, such as illnesses and pregnancy, were all contributory to participants' drop-outs.

To some extent, the attrition rate may have been influenced by the fact that the dietary intervention was developed using mainly Caucasian or European food, which may have limited the food choices of these participants who were all African women. As such, those who completed the study may have done so out of enthusiasm or sheer determination to lose weight, hence the outcomes obtained. However, it is also important to consider the timing of the drop out in interpreting the outcome of this finding. Given that the high dropout rate occurred earlier (first few weeks) in the study, a finding consistent with that of Larsen et al (2010), it may also be argued that this reflects participants' base-line motivation to lose weight, rather than a response to the actual dietary program.

It is crucial to take into consideration the attrition rate in the translation of a study's results as high attrition leads to a smaller statistical power. Although the complications arising from attrition rate and possible bias of the outcome, can partially be mitigated by adopting intention to treat approach (as discussed earlier). However, this approach has its limitations and may not yield robust outcomes, when used in lifestyle trials, as intention to treat was originally derived from drug trials.

Because of the high attrition associated with dietary RCTs, they are not considered to be ideal for lifestyle studies (Saturni et al 2014). Other approaches, such as non-experimental design might be considered for future trials where participants are given a choice of treatments that would better suit their preferences and lifestyle.

5.4.3 Demographic Characteristics

As stated earlier, the examined demographic variables of the study participants included age, marital status, educational attainment, employment, and ethnic status. The age bracket of participants was broadly categorised into those between 20-29, 30-39, 40-49, 50 years old and above. There was no significant difference in the demographic characteristics of participants between the two groups. Most of the participants had at least a first degree with several of them still in post-graduate education viz. Ph.D. Only two of the participants had lower than first degree (one participant with a diploma and another participant with a primary school education).

The high literacy level of the women in this study may be an indication of the educational profile of the African women across the NE Scotland. However, it may be argued that this result is confined to a small-scale feasibility study and may not be indicative of the case across African women living in NE Scotland overall. However, it does offer an interesting insight into this under-represented group, a factor that could be investigated in greater depth in a larger scale dietary study.

A large proportion of the women were in paid employment with just few (n=2) indicating there were unemployed, although in full time education (PhD and an MSc. Student). It is interesting to note that while some of the participants indicated they were in full time education, they also had a part-time job and mostly married (possibly with children, but this information was not collected as part of the demographics). This finding may offer an insight into the pressing demand these women might be grappling with, managing a home, a paid job and higher academic pursuit at the same time. This could have had an impact in their coping mechanism and was largely echoed in the reasons offered by the participants that dropped out. It would be interesting to investigate the impact of such demands and pressures on African women's response to dietary intervention in the future.

In some ways, the results of this study echo previous research findings associating socio-economic and demographic characteristics, such as education and income to dietary behaviour and adherence (Kell et al 2015; Shavers 2007). For example, Shavers (2007) suggested that income can influence access to healthy food.

Coffee et al (2013) associated income with health behaviour and outcome. More interestingly, Kell et al (2015) suggested that individuals with higher level of education, but without household income, are more likely to adhere to the convenience dietary pattern (Kell et al 2015).

5.4.4 Monitoring and Follow-up of Participants (Adherence/Compliance)

In contrast with other similar study protocols (Samaha et al 2004; Gryka 2011), this study monitored participants remotely via emails and occasional phone calls, but without any face-to-face meeting. Although participants indicated a preference for this sort of monitoring and follow-up during focus group discussion prior to the feasibility study, it is likely that the outcomes of this study would have differed and improved if participants were monitored in the traditional way of face-to-face meetings and contact. However, recent studies investigating effectiveness of web-based and smartphone apps, suggests improvement and adherence to dietary advice in adults (Hebden et al 2014; Cotter et al 2014; Patrick et al 2014). It will be interesting to incorporate and measure the impact of similar technology in improving adherence and compliance in future dietary studies involving African women.

Adherence and compliance to the diets was also assessed via a six-month post-intervention follow-up before conducting the semi-structured interviews. The post intervention follow-up was to allow participants to make sense of their experiences. It was assumed that interviewing the participants soon after the intervention ended may merely yield superficial information or a simple chronological account of their recently concluded experiences which they might be yet to fully assimilate. Evidence suggests that adherence to any new behaviour will often diminish as intervention is reduced or withdrawn (Artinian et al 2010). Other researchers also concur that initial behaviour change often declines over time as frequency of contact decreases and/or intervention ceases (Wadden et al 1998; Yeh et al 2003). Since the aim of this study is to assess the effectiveness of the dietary intervention by participants, it was considered more appropriate to allow them in the time following the intervention to truly assess whether any

change of dietary-related behaviour occurred and if behavioural change is sustained.

The choice of 6 months follow-up is supported by expert opinion that indicate 6 months as a critical time to assess maintenance; however, they acknowledged in their review that data comparing this period with others between 3 and 12 months are scarce (Artinian et al 2010). Similar to this study, Davis (2012) reported using a six-month follow-up of an eight-month weight loss intervention. However, several other studies have also used a longer follow-up of 12 months Nohlert et al (2013) or 24 months (Yeh et al 2003; Campbell et al 1999) and Although Nohlert and his colleagues (2013) viewed long-term follow-up periods as one of the strengths of their study, they also acknowledged the risk of memory bias. In this present study, the data collected via the food diary and reflective journals of these participants were devised to mitigate any risk of memory bias and comparison of data also helped to validate findings.

Since the over-arching aim of this study was to assess the effectiveness of the weight loss intervention, the six-month post-intervention follow up became even more crucial, given that weight loss maintenance is a principal consideration in evaluating weight loss programmes. However, the downside to this aspect of the study was the omission of taking anthropometric measurements of the women at the end of the follow-up period. Although the participants self-reported their weight at this point, it was not considered credible as the measurement were done out-with the clinical area and with different instruments and could not be checked for accuracy.

5.4.5 Food Diaries and Reflective Journals

The 3-day food diaries collected three times (week 1, week 6, and week 11) during the intervention was a measure introduced to further assess participants' compliance and adherence to the prescribed diets. According to Fyfe et al (2010), the method adopted in this study was shown to be a representative of 7- day habitual intake in free living individuals. However, the returned food diaries did not yield sufficient nutritional or dietary information, and therefore they could not be analysed using the WIN-diet or similar software since the contents were vague, lacked details, and participants did not quantify their food intake in most cases,

despite being given instructions for completing the diaries.

In hindsight, things could have been done differently to identify this gap earlier in the study. Perhaps if participants were seen face-to-face, and contents of food diaries reviewed during each visit, this shortcoming could have been mitigated.

Despite this limitation, the diaries did provide some striking insight into participants' struggles in relation to adherence and compliance. Descriptions provided by participants with the food diaries revealed non-adherence to prescribed diets, lack of knowledge on proper portion sizes, as well as what constituted a carbohydrate or protein-based food allowed in their prescribed diet. For instance, some participants in HPLC diets recorded eating the following meals for dinner, "fufu and soup/large pounded yam and potato starch soup, bowl of cereal, rice and sweet and sour sauce with chicken." (See samples of food diaries in Appendix E.)

Other plausible explanations to non-adherence to the prescribed diets as revealed by some food diary entries could be the fact that African staple diets are traditionally high in carbohydrates, therefore changing to a low-carbohydrate dietary regime could have posed a challenge for participants in HPLC group while those in CDD were affected by their inability to calculate the calorific content of their food or know the right portion required. More so, decrease in compliance may have been induced by limited food choices and the fact that the dietetic booklet provided to participants as guide did not include any African based food, as it was originally devised for Caucasian population. This assumption was reflected in the participants' reflective journal entries, which suggested that participants were struggling with limited food choices, especially the protein-based food. This concept was also echoed in the post-intervention interviews, which will be discussed in detail in Chapter 6 (see Appendix F for sample of reflective journal entries).

5.4.6 Strengths and Limitations of the Study

This study's findings should be considered in the light of its' strengths and limitations. To the best of the researcher's knowledge, this is the first study assessing the effectiveness and acceptability of HPLC and CDD among obese

African women in diaspora (NE Scotland). However, as this study was conducted using obese African women living in the NE of Scotland, the results of the study may have limited generalizability to other overweight or obese populations.

The small sample size and short duration of the intervention period poses a limitation to this study. However, the small sample size is justified as this was a feasibility study likely to inform a larger study. The number of participants recruited were deemed enough to be able to form a quorum for two post-intervention focus groups after accounting for attrition, but this protocol was later changed to one-to-one telephone interviews.

Careful attention should, however, be paid while interpreting the results due to the small sample size. This limits the study's ability to ascertain any major difference in weight loss between the two approaches. Hence, it cannot be assumed that similar weight loss in both diets will be obtained in a much larger sample.

The simple randomization adopted in assigning participants into their dietary group is an additional limitation of this study. This resulted to a slightly higher number of participants being assigned to the CDD (n=18) in comparison to the HPLC (N=15) group. However, a stratified randomization approach may have been more suitable given the complexity of the trial structure.

The remote follow-up of participants via emails and phone during the active dietary intervention period, was another limitation to this study. In hindsight, face-to-face meetings and visits would have been more appropriate and made it easier for participants to accurately complete food diaries entries, however this protocol was adopted based on participants indicated preference during the focus group.

Another limitation of this study was the omission of weighing the participants at end of the 6 months follow up to know if they maintained their weight loss. But this would not have been feasible because of the transient nature of this group which was the main reason for changing the protocol from post-intervention focus group to telephone one to one semi-structured interviews.

CHAPTER SIX: POST-INTERVENTION INTERVIEWS

This chapter presents the findings of the one-on-one semi-structured telephone interviews. Firstly, the questions or prompts that guided the interview are presented to enable the reader to understand the guiding principles or process by which the questions were generated. The rationale behind every question is highlighted, as well as participants' demographics and rationale for the choice of participants in the post dietary intervention interviews.

Subsequently, the findings of the post-intervention interviews are discussed in detail. The theme and sub-themes elucidated from the interviews are outlined with supporting quotes.

6.1 Background and Rationale for Post-Intervention Interviews

The original proposal for this stage of the study was to conduct a post-dietary focus group immediately after the dietary intervention ended. However, decision was made for participants to be followed up at least 6-month post-dietary intervention, instead, to allow them to make sense of their experiences. It was assumed that interviewing participants through focus group discussion soon after the intervention ended may merely yield superficial information or a simple chronological account of their recently concluded experiences, that are yet to be fully assimilated. Evidence suggests that adherence to any new behaviour will often diminish as intervention is reduced or withdrawn (Artinian et al 2010).

Similarly, Wadden et al (1998), Yeh et al (2003), and Middleton et al, 2013 all argue that initial behaviour change often declines over time as frequency of contact decreases, more so, when the intervention ceases entirely (Wadden et al 1998; Yeh et al 2003, and Middleton et al, 2013). Given that the aim of this study was to assess the acceptability of the dietary intervention by participants, it was considered more appropriate to allow participants time following the intervention to truly assess whether any change of dietary-related behaviour occurred and if behavioural change is sustained.

The choice of 6 months' timeframe for follow-up post-intervention interview was informed by expert opinions that suggested 6 months as a critical time to assess maintenance (Artinian et al, 2010). However, Artinian et al, reported in their review that data comparing 6-months period with others between 3 and 12 months are scarce (Artinian et al 2010). Other authors used longer follow-up of 12 months (Nohlert et al 2013) and 24 months (Yeh et al 2003; Campbell et al 1999). Although Nohlert et al (2013) viewed long-term follow-up period as one of the strengths of their study, they also acknowledged the risk of memory bias. In this present study, some of the data collected via the food diary and reflective journals of these participants mitigated any risk of memory bias and comparison of quantitative and qualitative data further helped to validate findings.

The rationale behind the change from focus group to one to one telephone interview is that this population was very transient. Many of the participants were students who moved to other countries or other parts of the UK after graduation. Others were married women that moved with their husband's transfer or assignment to other locations. Since the completion of this dietary intervention, some of the participants had moved from the North East Scotland to within and outside United Kingdom - London, Southampton, Saudi-Arabia, Canada, and Nigeria. Contacts made to recruit participants for the post-follow up focus group demonstrated that it was challenging to recruit enough participants to take part in a focus group discussion, due to their differing locations. Out of the eleven completers in the CDD group, four had relocated within the six-month post intervention period, one was in the process of doing so and two could not be reached; indicating only five participants were available. This was not enough numbers to make up a quorum for a focus group. A similar pattern was also noticed in the HPLC group. At this point, it was decided that telephone or Skype interviews were a good alternative as most of the participants, including those that had moved, were able to participate in an interview via telephone.

Both focus groups and interviews had been identified as qualitative research methods that could be used to assess the acceptability of an intervention for the target population and setting (Ayala and Elder 2011); hence, choosing telephone or Skype interviews as the primary approach for data collection at this stage was deemed appropriate. After considerable deliberation, telephone interviews were

considered more accessible as some of the prospective participants did not have Skype and in some cases, did not have a webcam. In all the cases, the participants had access to telephones; hence the choice of telephone over Skype interviews.

Face-to-face interviews allow for development of a rapport with respondents, give the interviewer the opportunity to observe participants' body language and other non-verbal communication clues such as nods, smiles, frowns, etc., which is not possible with telephone interview (Stephenson 2011). However, some disadvantages such high cost per participant, geographical limitations and time pressure on respondents (Szolnoki and Hoffmann 2013) have also been identified as associated with face-to-face interviews. Interviewer bias is also more likely to occur in face-to-face interview as the interviewer may adjust his questions to suit the respondent's body language (Szolnoki and Hoffmann 2013). On the other hand, while often criticised, statistics show use of telephone interviews is still a significant survey mode (Arbeitskreis 2012), with its advantages as being less intrusive and being able to elicit open and honest responses as participants feel safer and more anonymous (Ogden and Clementi 2010). Telephone interviews tend to be less costly and time consuming than face to face interviews as the interviewer does not need to travel to participants' homes and can schedule more than one interview in a day. However, telephone interviews are restricted to only those that have access to telephones.

Several other studies have successfully used telephone interviews (Wyse et al 2012; Artinian et al 2007). Moreover, Vogl (2013) conducted semi-structured face-to-face interviews as well as telephone interviews with the same subjects and obtained similar results, thus validating the use of telephone interviews.

6.2 Methods

6.2.1 Choice of Interview Questions and Participant Selection

The suggested interview questions were informed by preliminary findings from the focus group and entries from the food diary and reflective journals collected during the 12-weeks active dietary intervention stage. Comparing the post dietary measurements with those taken at baseline, the results show that some of the

participants lost varying proportions of weight, while a few gained weights. Given this outcome, the researcher decided to select three participants from those that lost considerable amount of weight and three from those that lost little, no weight or gained weight, in each dietary group for the interview. In total, 12 participants were selected - 6 participants from each dietary arm.

Through these interviews, the researcher sought to understand factors affecting motivation to start and sustain dieting, as well as explore participants' opinion about changing their dietary habits. It was useful to explore if the more successful participants were already contemplating weight loss and had set targets ab-initio.

Other questions were targeted at understanding underlying factors of effectiveness of the diets themselves. Some of the participants noted in their reflective journals that they persisted in the intervention because they felt a sense of failure if they did not finish. One participant had consulted her GP for a weight loss prescription before the study was announced and thought joining the intervention was a better option than resorting to taking medications for weight loss. All this information contributed to the selection of the question.

Emerging themes from the food diaries and journals further suggest that some of the participants had significant challenges adhering to the diets for several reasons. Some of the perceived issues noted include difficulties in changing food habits, impulsive eating out-with stipulated diet, food indulgence, skipping meals, late night eating due to family, work and academic related stresses.

Other difficulties encountered include how to calculate calorific content of African foods, how to determine food portions, finding daily recording in journal tasking (if this was mentioned in the interview, explanation was given to the participants that this was just a tool for data collection and not a general requirement for following the diet) and struggling with implementing diets due to social and family network influence. For instance, some of the participants noted not following the diets when they had visitors, during parties, and outings with family, as well as during festive periods such as Easter.

The above informed the interview questions, with the aim of teasing out how participants managed on the diet that they were assigned to, areas of improvements and other influencing factors that may have impacted acceptability

or non-acceptability of the diets. On the positive side, some facilitators were identified, such as self-determination to achieve the dietary goal as well as support from family, friends and work/university colleagues. Some the key points noted will be reported fully in the findings or discussion below.

6.2.2 Data Collection

All the semi-structured interviews were conducted by telephone. Although these participants already knew the researcher and had established a rapport during the dietary intervention stage, it was important that the researcher introduce herself to set the stage. This was followed by a discussion on the purpose of the interview and an overview of the agenda. This provided a baseline for expectations on both sides. The participants were also reassured of confidentiality of information shared as well as their right to discontinue the interview at any time. Their consent for participation and permission to audio- record the interview was sought (although consent forms were sent by email prior to the interview date, signed, and returned). Each telephone interview lasted between 30 minutes to 1hour, was digitally recorded and were subsequently transcribed verbatim for analysis.

An interview guide for the post-intervention interviews covered a range of topics as indicated earlier (see table 6.1 for the semi-structured post-intervention interview questions and probes utilised):

Table 6. 1 Post-intervention interview questions

Post-intervention interview questions and prompts:

- 1. 'Do you want to ask me anything before we begin?' or/and**
- 2. 'What made you decide to volunteer to take part in this study?'**
- 3. 'Tell me your overall experience whilst on the diet'**

(This is a general broad open-ended question aimed at getting the interviewee to share their experiences. If she did not readily share her dietary experiences, probing questions aimed at the topic, especially the barriers and/or benefits encountered, were asked). More specific questions were then asked to elicit further information, such as:

- 'How did you find the diet on a day-to-day basis?' (At this point, the interviewer expected participants to discuss possible challenges or barriers they encountered – some of which were identified in their reflective journals and food diary entries. Examples include difficulty adapting to the new diets, difficulties with calculating calorific content of African food (for the CDD group), and calculation of carbohydrate input daily allowance/limits (for HPLC group). However, if the participants gave short answers or digress from the question, the interviewer utilized appropriate prompts, using the pointers below to probe further and ask about specific challenges, for instance:
 - a. 'Tell me about your experiences using the dietetic booklet provided and calculation of carbohydrate input daily allowance/limits? (for HPLC group)
 - b. Tell me about your experience with calculating calorific content of African foods? (For CDD group)
 - c. Tell me about your experiences in following the diet that you were allocated.
 - d. How did you manage these experiences?
 - e. If you did not manage these experiences well, do you have ideas about what you could have done differently or what could have helped you do so?'

- 4. In general, how would you describe your overall feelings or experience about following the diet?** (This question was to elicit positive and negative thoughts, and general feelings and opinions about the diet. It also aimed to obtain alternative views of participants who did not lose weight, as some participants might have felt better physically even if they did not lose weight. Appropriate prompts were utilized to guide this aspect of the conversation, especially if participants were generic in their responses). Depending on the response, if positive, researcher asked the flip side to the question. If negative – the researcher would then move to the next question.
- 5.** In your opinion, what could have been changed or included in the weight loss program to improve the outcome for you?
- 6.** Were there events or situations in your life that influenced the way you responded to the diet?

At this point, the interviewer expected participants to reply with some of the events and circumstances noted in their diaries.
- 7. Tell me about your experiences or how you have been doing since the dietary program ended?** (This question was aimed at eliciting information on whether participants had sustained new food habits or returned to their original dietary pattern. Exploring this aspect of participants' experiences was crucial, considering that behavioral changes could play an important role in weight loss maintenance. Moreover, the rationale for extended follow-up period for the participants was to assess whether any changes in dietary-related behaviour had occurred and if so, was adherence - sustained.
- 8.** In conclusion, the interview goal was to enable the interviewer to ensure that the topics intended to be explored which was to assess the sustainability of the dietary interventions and elicit participants' experiences whilst on the dietary intervention was covered. Moreover, to allow participants to raise any issues that may be important to them which may not have been covered during the interview, the following prompt was used:
 - Is there any other issue that we have not discussed which you feel should have been addressed? Or do you want to add anything on what we have discussed?

As the interview progressed, other probing questions were employed to elicit details where necessary, such as: "You mentioned..."; "tell me more about that"; "What else occurred?" Or "- you talked about... please describe that experience in as much detail as possible"; "-You said... would you explain why you believe that?" Other clarifying questions were also employed such as; "can you expand a little on this?" "Can you tell me anything else?" "Can you give me some examples?" etc...

6.2.3 Data analysis

The analysis of the post-intervention one-to-one interviews was carried out following the five-steps of Krueger's (1994) framework (see section 3.3.5); used for analysing the focus group data.

To ensure the rigor and robustness of data analysis, a second qualitative researcher independently co-analysed the data using the same framework and method. The content from both analyses were combined and compared; agreement was reached on identified categories and sub-categories descriptive names to facilitate interpretation.

6.3 Results/findings

Although the experiences of the participants involved in this post-intervention study were exceptionally insightful and unique to every one of them, common patterns ran through the accounts of their individual experiences pre-, during and post- the dietary intervention. The emergent themes from the semi- structured telephone interviews are used to explore if the prescribed diets were effective and acceptable within this study population, which was the overarching aim of this study.

First, the overall findings derived from the interviews will be outlined by introducing the major themes generated from the participants' interviews. The succinct introduction of the main themes will be followed by their constitutive sub-themes. A topic sentence will then be given for explanation and augmented by

quotation/s in italics and enclosed in quotation marks (“”) to clarify the theme. Broken lines (...) are also adopted to denote a pause or an expression of portions of statements that are not applicable to the phenomenon described. A total of seven major themes emerged from this analysis and for ease of arrangement and discussion, the themes were harmonised under the timeline of their occurrences under four main categories, namely: Pre-intervention, Intervention, Post-intervention experiences, as well as the Cultural Aspects theme cutting across the study spectrum (see Figure 6.1).

6.3.1 Pre-Intervention Themes

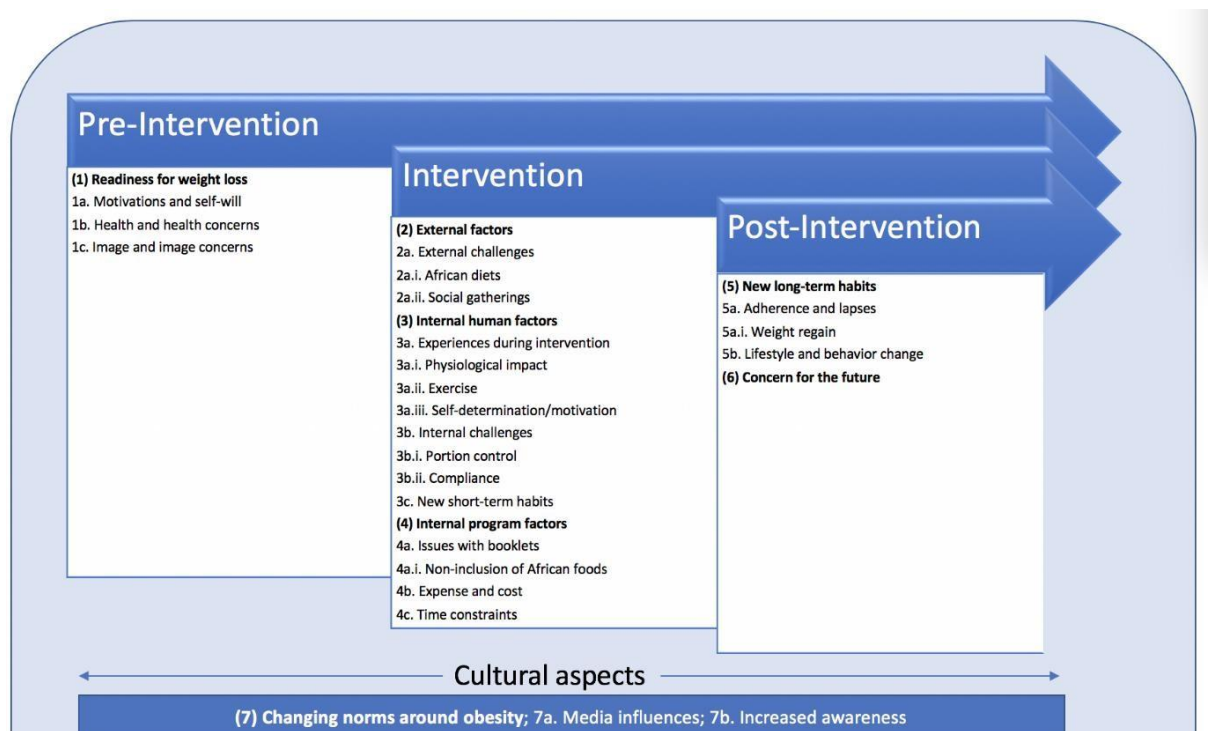


Figure 6. 1 Chronological Display of Post-Interview Themes

As mentioned earlier, the themes identified have been harmonised and grouped under the timeline of their occurrences. The theme and sub-themes categorised under pre-intervention delineates participants’ views, and opinions about changing dietary habits, and factors that influenced their decisions to embark on the program. It further described participants’ experiences prior to joining the

program, and the state of their mind, their readiness or lack of it, ahead of the intervention. Ranges of views, experiences and factors that informed participants decisions were highlighted, as shown in figure 6.2 below.

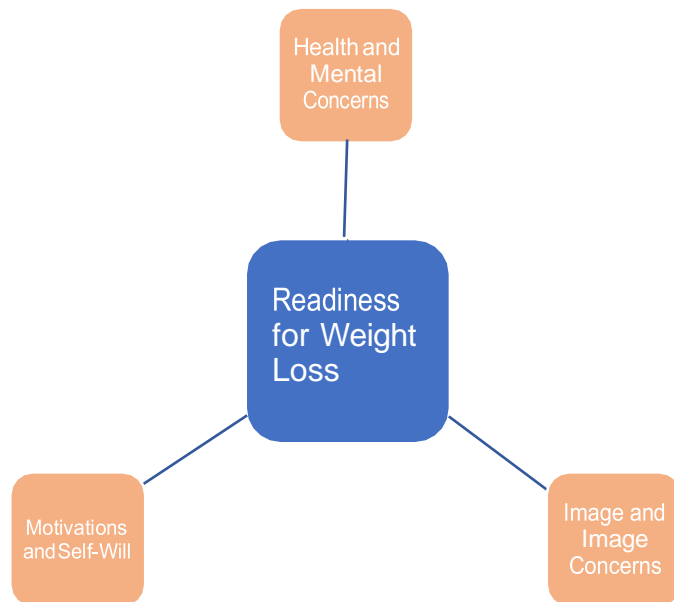


Figure 6. 2 Themes and sub-themes of readiness for weight loss

Theme 1 - Readiness for weight loss

All the African women involved in the dietary intervention unanimously seem to have been contemplating weight loss and had even began to make plans to embark on some form of dieting when the call for the study was made. They expressed a strong motivation to participate in the dietary intervention from the onset:

HPLC10: "I have been struggling with my weight for a while now, in fact for a very long time but most recently, just before I volunteered, I've just gained about possibly 7kg or about that; 6 to 7kg and I wanted to, I was looking for how I am gonna kind of lose it."

CDD07: "I really wanted to lose weight and there were a lot of people in my ear telling me that I was too big and that I needed to go on a diet"

CDD07: "I think for me, it was just that moment in time in my life where it was a thought; it was going through my head, it wasn't anything sudden or out of the blue. So, I would say that really helped me in the way I reacted

to the diet program.”

1a. Motivations and self-will

Although all participants wanted to lose weight, they cited several insightful reasons as their motivating factors for joining the study and embarking on the weight loss programme. Some of the reasons cited by participants include their unhappiness with weight gain, excessive weight gain after coming to the UK and starting a PhD, accumulated weight following childbirth, perception of social trend, demands, pressure from television and advertisement. Failure from previous diets and inability to lose weight on their own were also cited as reasons to try out something new:

HPLC04: “I was wearing like size 12, 14 and I came, and I started wearing size 16 and I wasn’t happy about it at that moment.”

HPLC04: “I have put on weight; before coming to do PhD, I wasn’t as fat as I was when I started the program. So, I wasn’t happy with my weight then”

HPLC10: “I volunteered for that with the hope that I would learn something from it, and I’ll lose some weight in the process”

CDD03: “I wanted to go on a diet because I have put on a lot of weight. I was size 8 when I came but I put on lots of weight after giving birth to my children; so, I want to go back to my normal size... Again, most of the time you go to the shop, the top may be large, but your size may not be there, that’s another challenging thing for me, though I tried to go on a diet.”

CDD03: “you go with the trend of the society; nobody wants to put on weight... the advert and every other thing on the television, the pressure from the society and, fat can also cause so many diseases, that’s another reason to go on diet.”

HPLC02: “: I wanted to lose weight because I was overweight; I decided to try and participate to lose weight. I also wanted to have a feeding pattern,

to develop good healthy eating habit.”

HPLC09: “I was happy because I have been trying on my own to lose some weight by myself as well, to cut down on my food intake and all what not. So, when I heard it, I was happy to join.... Just for my weight watching which I benefit as well from it. That’s why I joined.”

CDD07: “I had always wanted to lose weight and there’ve been a lot of diets I have tried, and it didn’t really work out”

CDD11: “I already realized that I am become unhealthy and overweight and I didn’t have any other option that was favourable for me to follow.”

1b. Health and health concerns

Additionally, participants provided extensive details on the rationale behind their decisions to volunteer for the weight loss programme. These included fear of developing debilitating illnesses associated with obesity and desire for optimal health and struggle to return to normal body weight post childbirth. Participants were also pleased with the manner of approach of the researcher in reaching out to them:

CDD11: “I think that even the way that I was approached by eem you, it was like a call, it was like you knew me for what I was, and it was quite a recognition; many people want to be recognised when things are alright but I thought it was a very good opportunity being recognised as such a time for my own benefit.”

HPLC03: “After my 3rd childbirth, I had gained weight and I have tried to lose it for 2 years, but I wasn’t successful, so that was one of the things that motivated me in joining the program. “

HPLC05: “when you first mentioned it to me, I was really excited because I thought I needed to reduce my weight, so I thought, ‘what is wrong in going on with the program?’, so that was why I did the program.”

HPLC05: “I just wanted to reduce it, because I know that no matter how

much weight I reduce at that time, it will be good for me. At least it helps to prevent further occurrences of other sicknesses in my body.”

CDD02: “I was not at a healthy weight then... but I needed something to ginger me up and then I found out about it.”

CDD02: “So, it was for my health....to be healthy, to be healthy, to get myself to a healthy weight, and bring my weight down really. And then, yeah for my health basically.”

CDD07: “I was always interested in doing diet to see if I can lose weight. So, I was willing to give this one a go.”

Health and health concerns was a reoccurring theme as participants expressed concerns about the health implications of carrying excess body weight with one participant citing her suffering with high blood pressure as a motivating factor to lose weight.

HPLC05: “Yeah, apart from my weight loss, I had high BP (blood pressure) and I thought going in for the program will actually help me reduce it.”

HPLC02: “To be healthy and live long you know. When you lose weight you will be healthy, happy with yourself and live longer you know, excess weight is no good you know, so that’s why.”

1c. Image and image concerns

Body image was also highlighted by the participants with majority of the women expressing dissatisfaction with their body shape and whom they have become due to excessive weight. Looking good, returning to their previous body weight and finding it easy to get clothes that fit were all cited as significant motivational factors that influenced their decision to embark on lifestyle changes involving dietary intervention:

HPLC04: “psychologically, I wasn’t feeling good with myself, I need to

connect with my former self. If I put on weight, I'm looking like someone else, to me it's not good for me, like mentally it affected me."

CDD11: "it was an eye opener to think of obesity on my person who is of an African background, before I came into this country, I wasn't overweight; so, it's definitely the diet and the things I started to eat or add to my diet were not the best things.

HPLC03: "to also look smart; you know; my clothes were getting tighter on me and I felt I would like to lose weight."

CDD02: "it was my health and then I didn't like the way I looked in my clothes. Yeah, they didn't fit well on me, my tummy was bulging, my arms."

HPLC10: "I just wanted to feel a lot healthier and look good obviously"

CDD03: "... also, fat can also cause so many diseases, that's another reason to go on diet."

6.3.2 Within-Intervention Themes

The themes under this category delineate the participants' overall experience during the dietary intervention. Three major themes (external factors, internal human factors and internal program factors) that emerged captures participants' perceptions of prescribed diets, factors that may have impacted their responses to their assigned diets and how those factors shaped their overall experiences (see Figure 6.3 for themes and sub-themes within intervention).

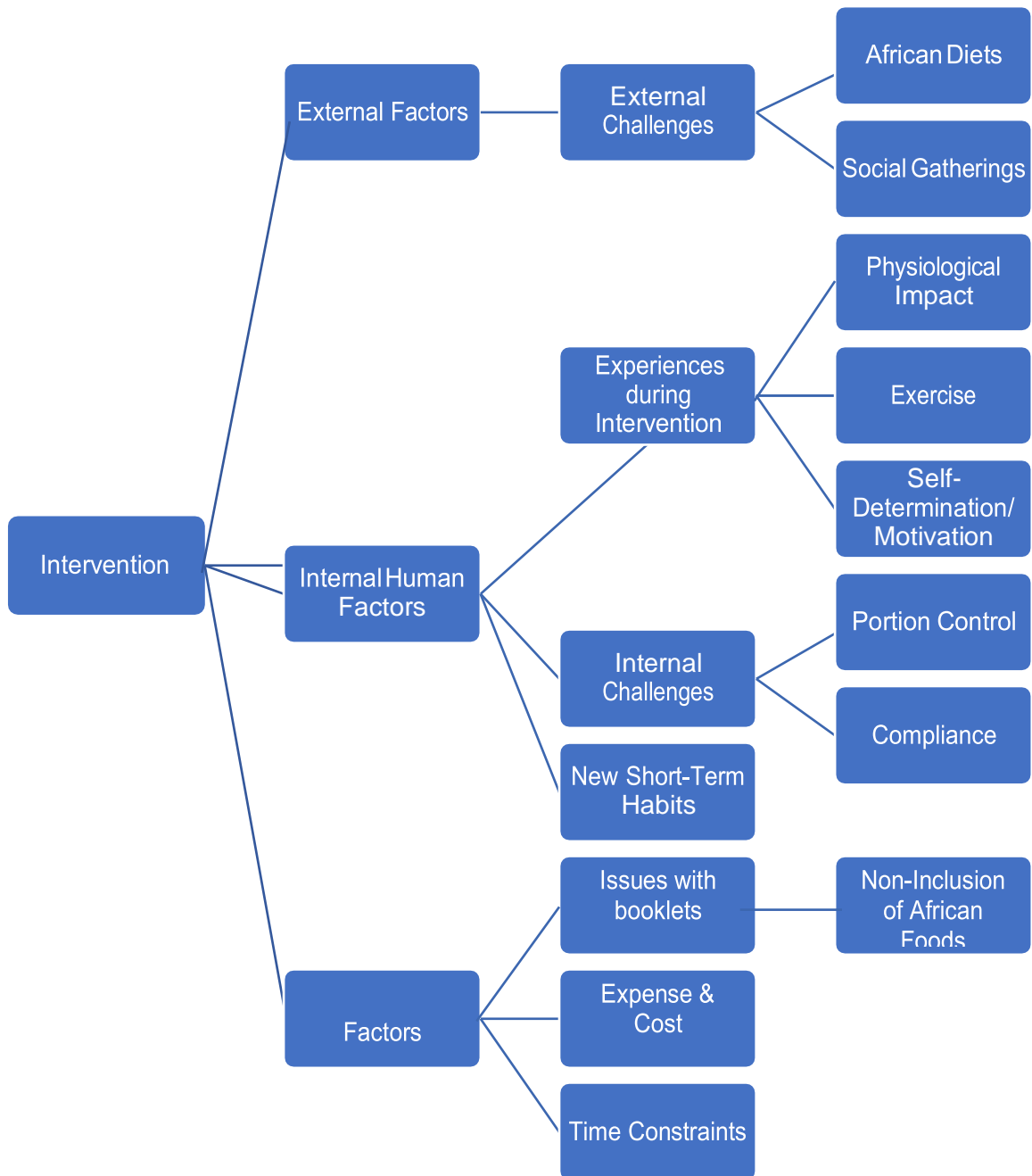


Figure 6. 3 Themes and sub-themes within intervention

Theme 2 - External factors

Several external factors were identified as impacting participants' experiences during the dietary intervention. Some of the reoccurring themes under the external factors were external challenges, African diets and social gatherings.

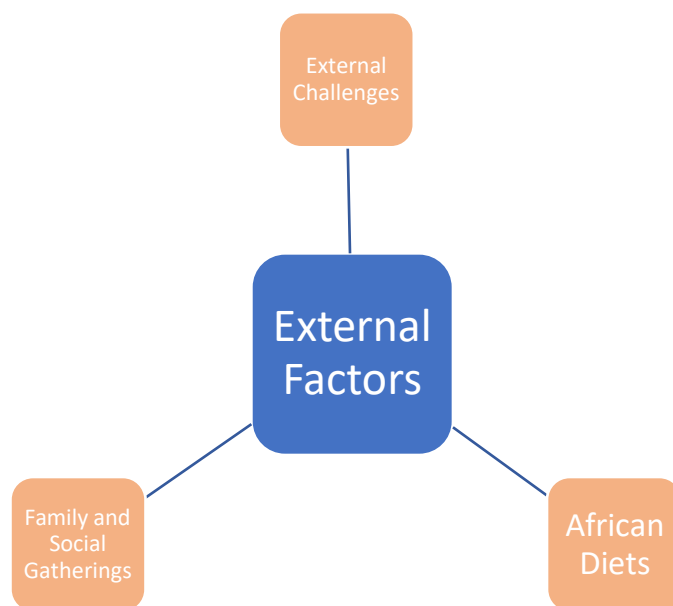


Figure 6. 4 External factors

Participants reported range of challenges experienced during the dietary interventions. Most of the challenges reported were experienced at the beginning of the intervention. Challenges cited ranged from craving, hunger, high cost of proteins foods (for those in HPLC group) and vegetables, not coping with work, portion control, adapting to the new regime:

HPLC04: "In the beginning, it was not easy for me spending money to be buying food from the cafeteria, to buying like chicken because it is protein and vegetables..... changing my diet to taking more of protein and vegetables wasn't easy for me from the beginning."

HPLC10: "Because I go to work, for me it was a challenge. To keep the protein level which means I needed to have protein for lunch, so trying to get protein ready from home to work was a bit difficult."

CDD03: "It was very challenging. You have to cut down the quantity of food you have to eat. Because I needed it, that was why I forced myself to take a little portion to reduce my weight."

HPLC02: "initially it wasn't easy because it meant I had to cut off a whole

lot of food and things I love eating, for instance, I love eating bread. That means I have to cut off a whole lot of bread and a whole lot of other things.... in the first few days I was so hungry because I wasn't eating the main thing, I thought I was used to eating; then, by the time I got a hang of it, I started enjoying it."

CDD07: "I had challenges of trying to wean myself from the past lifestyle to start now to think of just depending on things healthier."

Furthermore, the influence of the perceived higher costs of healthy foods, unavailability of varied healthy options and time constraints were other reoccurring sub-themes that emerged:

CDD11: "the challenge I had was I find eating healthily a bit more expensive, so it was quite expensive to adjust to because for me to get fruits and vegetables adequate for the day, it was quite a challenge... before then I would eat anything that is on the cheap line without worrying, it was quite a challenge in the beginning and needed a lot of determination specially to share with the family, So, even changing my own lifestyle was also difficult to be part of the family in the first days and into the later days."

HPLC09: ", going to the supermarket looking for the less calorie thing, checking the back; sometimes there is no time to do that."

CDD11: "what you want is not there or you can't find it, especially like I go for conferences where we just eat things like take-away because you are away from home you can't cook, you can't, and it became quite a challenge at the beginning to really find or to walk around healthier options."

One participant particularly expressed frustration emanating from cooking different meals from that of the family, which she found to be extremely daunting and noted that this led, in part, to her inability to stick with the stipulated dietary regime:

HPLC05: There were a lot of difficulties. As a family person, there were problems of having to cook for other people and then find something else for myself to eat at the same time... I was eating some of the food that other members of my family were eating which did not actually help me.

2b. African Diet

The highlight of this sub-theme was the participants' expression of lack of ideas on wide variety of protein-based food from their traditional African diet. They buttressed the point that most staple African foods are majorly carbohydrate based, and as such, had limited access to and idea of protein-based food, except with the knowledge of few outlined:

HPLC05: "... some people don't have lots of ideas of food that will give one protein.... when you eat the same kind of food like meat or fish or egg all the time, sometimes you really get tired and you want to eat something else. So, basically, we lack ideas of types of protein one could take, I know few of them but maybe there are other food that are high in protein, but we are not aware of that."

HPLC05: "like coming from the part of the continent I came from – West Africa, Nigeria, the kind of food we eat, our traditional type of food that we eat is mostly carbohydrate based, we tend to eat that most of the time – things like rice, eba, tuwo – tuwo sinkafa, I don't know whether you understand what I mean by that? It's all made with rice; pasta, indomie for the kids; basically, there are carbohydrates-based. It's only things like moi-moi or things like pure beans, fish that one will say is protein based but most of the things we take are mainly carbohydrates."

Participants felt being pressured to join in the family meals which is often carbohydrate based and abandon their prescribed diet, due to lack of protein

option readily available in the staple diet. This struggle is well captured by this participant's expression:

HPLC05: ", most of the food we take are mostly carbohydrates, more of carbohydrates than protein, so it was really difficult for me..... whenever I cook the food; there is this temptation of wanting to eat that kind of food rather than sticking to your own kind of meal one is expected to take.....most of my family members don't even like beans in the first place, so it was like I will find it difficult to cook beans for the whole family and eat with them, because they don't even like it."

2c. Family and Societal influences

Participants also recognized and highlighted the influence of family and society in promoting less healthy foods, however, some positive influences of significant others were also reported:

CDD11: " socially it was more challenging at home than at work, at work it was good, because everybody, most people these days are trying to talk healthy eat healthy, they are trying their best and you will hear of different diets or things like that."

CDD07: "I really wanted to lose weight and there were a lot of people in my ear telling me that I was too big and that I needed to go on a diet"

HPLC05: "the fact that one is a family person and you have to cook for people all the time; that was actually a problem for me. I find it difficult to cook; because of the time -cooking for the whole family and the time to find your own kind of food to eat might not be there."

CDD02: "It was not an easy task at all. Having to manage the family food, as well as mine by the side, juggling jobs and all that, it wasn't easy."

CDD02: "Oh men! I had lot of support, serious support from my family because all my siblings are slim... in a nutshell, they always tell me 'you have to lose weight, you have to lose weight,' I mean. And they are more

concerned about my health than anything else, so they are always telling me.”

Across both dietary groups, food within social environment were sometimes cited as barrier to non-adherence to the dietary regime as participants temporary abandoned their diets:

CDD03: “You go to party and you see all sorts of food, rice – you will be tempted to eat everything but if you are when you go to a party (chuckles), you see different types of food, you will be tempted to eat; that’s another challenging self-discipline, you know what I am talking about; you have to control yourself.”

HPLC03: “if I went for a party and my friends are having food, having drinks, if I say I will just go for water and a little meat I don’t want rice, they will say, ‘why, why are you doing that, are you okay?’ So that’s, those were typical situations where sometimes I just tried to keep dieting aside so that people don’t ask me.”

Theme 3 – Internal human factors

Several factors were identified as internal human factors that may have influenced or impacted the outcome of participants’ experiences during the dietary program. These factors are shown in figure 6.5.

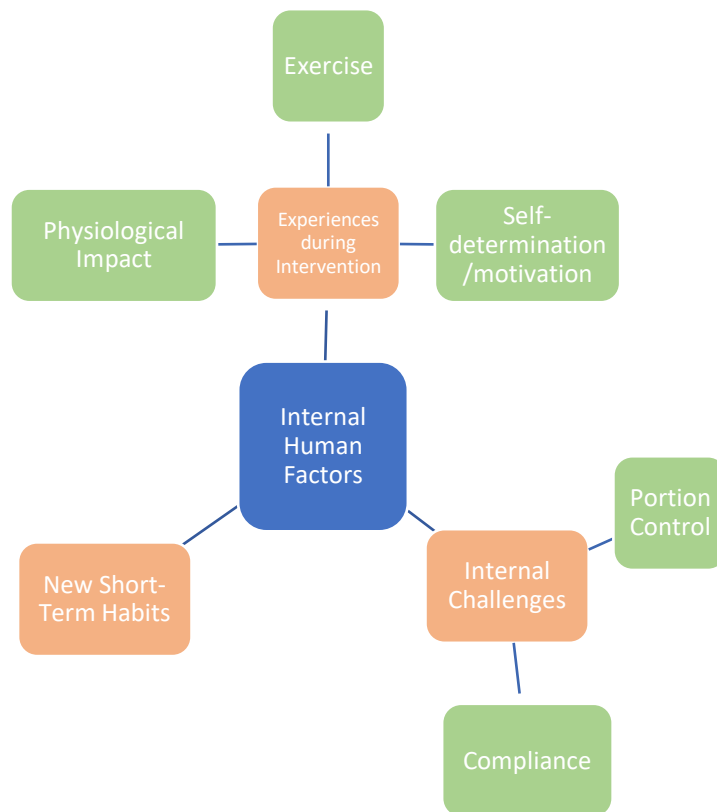


Figure 6. 5 Internal factors

3a. Physiological impact

Several participants reported experiencing some negative sides effects associated with the diets. Participants from HPLC mentioned experiencing some side-effects linked to the diet, such as dizziness, weakness, and headaches. In CDD group, feelings of hunger were reported, a symptom probably resulting from reduced portion sizes. However, in both groups, some of the participants expressed that their persistence and commitment to completing the program enabled them to overcome this aspect of the challenge. This informed choice may have been influenced by detailed information given to participants at the onset on the common side-effect associated with the diets:

HPLC09: "when I started it, first few days I was feeling so dizzy and because of the activities I was on; apart from that dieting I go to gym, I am a full time worker, I am a full time house wife, so I combine everything together, it was not easy; there were lots of things going on there, . It was challenging and at a stage I wanted to stop but I said to myself, 'you have to, what you have started you have to finish it!'

HPLC03: "I was very weak, I felt very weak and I felt dizzy; some days I had my craving habit but after a while my body system started adjusting to the fact that I tried to keep to meal times because; one of the ways I went about it was trying to stick to meal times and I avoided eating in-between; even when I wanted to eat in-between it will be for something that is of less starchy, so, it was just that kind of things like feeling tired, feeling light and migraine; those were like the side effects, so that was how I felt."

CDD02: "I was actually suffering from withdrawal or whatever. I was actually hungry and felt like I was fasting and for many days, I will keep to it for a while and then break and eat something."

3b. Experiences during intervention

Despite the challenges and side effects experienced, many of the participants found the diets useful and educational, and perceived positive impact on their health and enabled them to adopt healthier lifestyles post-intervention.

Participants expressed their emotions with such words as satisfaction, joy and happiness for participating, empowered and equipped through participation. One participant suggested that the program should be developed or enhanced further and administered to other African women:

HPLC02: "It was quite a very good experience and it's been a very good thing and I will encourage and comment that maybe it can be developed further and given out to African women so that they can help, it'll really help them."

HPLC10: "my overall experience, it was okay; I think it's like in every diet, it's not specific with this, it needs a bit of discipline obviously and being prepared."

HPLC10: "first few days, probably not bad, I think my only concern is to actually adopt as in a long term, life change. For me, personally, it was struggle but I did understand that I had to work on my carbohydrate intake;

that it is quite crucial to have that watched and to ensure that my protein level is high and have the right vegetables in place and all that.”

HPLC10: “one thing I picked up from this is that my carbohydrate intake has to be watched if I want to lose weight or maintain my current weight. So that was my experience really.”

CDD03: “I was very happy, and I really enjoyed it because when I was overweight, if you are overweight, you find it very difficult to bend to walk around but you find out that after losing some weight, I can easily walk around and do whatever I want to do. So, I really enjoyed losing weight.”

HPLC02: “I thought it was good, I thought it was educative, I thought it was enlightening, I thought it was very good. I had a good feeling; I didn’t have any bad feeling towards following it.”

HPLC02: “It’s a good procedure to follow, and it was good for me, I liked it and I would love to do it again. It helped, I saw the effect and the evidence on me. So, the little I managed to do, it came out well, there was achievement, so it’s a good thing and if it is to come again, I would love to do it again.”

CDD07: “At first it was very difficult; you know the food intake and everything... overall it was okay.

CDD07: “It was a good experience overall, I learnt that it is possible to; at the end of the day it was possible because I did lose weight and I saw changes.”

CDD11: “it’s really equipping should I say and empowering. I felt so empowered to be able to make a decision especially when it came to knowing what is in the food.”

CDD11: “it made me more empowered to decide if I want to continue eating the things I used to eat, like I could eat 3 packets of haribors without giving it a thought and when I see a meal I will still eat a meal; So, it was quite fascinating, to me that was the most amazing part of the whole experience.”

CDD11: “Really this is incredible, truly incredible; I think I have spoken to more people; I’ve challenged more people I am a personal testimony to

many people, - seeing the change in my health and everything about me. They've seen me shedding off weight on day to day basis and they are like 'Whoa! How are you doing that?'

P4: "It was a nice experience though, at least people saw that I was losing weight, I was buying clothes that were a size less."

HPLC05: "for me, I wasn't able to follow that strictly because of some of the issues I have mentioned to you and that actually made me not to achieve the very aim of undergoing the program itself."

CDD02: "It was quite a rewarding thing to see that at the end I had lost some weight....so happy because it was something of course I wished I had done something about it, I only wished but didn't do anything about it but eventually I did something about it."

3c. Exercise

Participants pointed out exercise as an integral part of any weight loss and expressed they would have loved to have exercise incorporated into the weight loss programme. Although, structured exercise was deliberately omitted as the study was aimed at just assessing the effectiveness and acceptability of the two diets; it's certainly an area to be considered in future interventions of this type. The participants that incorporated some form of exercises expressed they enjoyed it, but could not sustain the lifestyle due to lack of motivation:

HPLC10: "I don't know if it can be done in a way exercise can be incorporated in it because I think that is important as well.... I think exercise is important in any diet...even if it's just jogging or power-walk for 30 minutes

CDD11: "maybe more exercise. While I did a little exercise like walking and all that, I became more active, the lighter I became the more active I became but was kind of self-motivated but I think exercise is something that you need companionship ... while its self-orientated program but I think with exercise I found it quite challenging because I was lazy, some days I don't want to go which I felt that part of exercise is missed.

CDD11: "... the beginning I was quite excited that if I had adopted a certain pattern of exercise, I would have just carried it on till now but because it was self-motivated; when I lost the motivation, there was nothing to keep me back on."

HPLC05: "... time I was actually wanting to lose weight by going for exercise... it will be more effective with you if one sticks to the program and maybe with exercise."

3f. Portion control

Participants expressed mixed experiences with portion control. While some struggled with adapting to a new regime of reducing quantity of food, others could not figure out quantity of African food constitutes a portion. There was also a general feeling that the food in the sample booklet used as examples of portion-control were all Caucasian-based foods, resulting in a sense of frustration among participants. However, some of the participants persevered and overcame the obstacles, but by sheer determination and devising unconventional means to estimate portions of African foods:

CDD02: "...we don't just eat only European food, we eat our own kind of things a lot you know. I would rather eat our own food you know, so the calculation was difficult."

CDD03: "since you eat little portion, you feel very light and you feel like eating more."

HPLC09: "I didn't even use that thing as it is verbatim, I used my initiative. I need to get a scale to be weighing but there is no time. What I did was the portion of food I normally eat I cut it into half and consume half instead of consuming the whole bowl of food."

CDD07: "I use to eat, obviously it was bigger portions, snacking and everything but with the diet, I have to have smaller portions."

CDD02: "Initially, it was quite a struggle but after a while I learnt to control the portion and the kind of food."

P5DD: "I mean I was forced to start checking how much, you know, how much I was serving, how much I was eating, what I was eating."

3g. Compliance

The reactions of participants in the HPLC diet group were more diverse, with some reporting both positive and negative encounters around compliance to the dietetic booklet given to them. Some participants reported benefitting from the list of protein-based foods outlined in the booklet, which enabled them to lose weight and served as a generic guide:

HPLC04: "The book really helped me because I don't really have to start thinking of what kind of protein I should take, the amount I should take. At least the book made it easier for me"

HPLC10: "The booklet was fine; I think it gives a good idea of portion sizes possibly."

HPLC02: "The booklet gave me an idea on what to have, on the type of food I could eat and what not to have and it set me on the path of choosing the right meal; like it helped me choose, make my meal for the day and for the week. So, the booklet gave me, it was like a guide to the weight loss"

3h. New short-term habits

Participants listed a range of newly acquired positive habits, such as being more aware of food type, more conscious of food labelling, having better portion control, and following a healthier lifestyle that includes regularly taking essential multivitamins which was prescribed to the HPLC group during the dietary intervention. Some of the participants indicated they carried on with their acquired new habits, although others lapsed but wished for a repeat of the study or possible way a forward:

HPLC02: "Every day was a struggle but because you have that determination to achieve something, I kept on carrying on. Because when

you wake up, that first few weeks my body was shaking, inside my body was shaking, so, you know, you need something to eat”

P6:” from the experience I’ve changed my diet, it has really helped me, I now take more of protein and vegetables.”

HPLC04: “The experience from the program actually helped me because when I go to buy something, I make sure I check the carbohydrate content and the protein, at least now I’m aware that when I’m buying something, I don’t just pick them up from the counter, I normally check the nutrition content and something like that.”

HPLC04: “Very useful, at least I am aware now, actually I am conscious of and I have to be careful of what I take, so I normally check food, anytime now I buy food I check all those contents.”

HPLC10: “one thing I picked up from that program was that – I think because you actually put us on multivitamins, I then formed the habit of taking multivitamins and since then, I have been on multivitamins constant. I think it has made a difference in my health. Also, the fact that you are trying to lose weight all the time, my overall diet, is probably not I think that was something I picked up, my overall health has improved.”

P006: “although I followed the diet, but my mind was not there because the PhD have taken more of my attention you understand..... Maybe if I was not doing PhD and was working and wasn’t stressed, yes, I’m sure I should have been able to see things better or differently

P006: “I followed the diet but, you know I go to school, sometimes I get hungry, sometimes I had like break the rules to take something just to keep me going. So, my response to the diet I can’t say, I can’t say was 100%.”

HPLC10: “I feel one thing you should – if you have the opportunity of enlightening African women about it, is on limiting the amount of carbohydrate we have and balancing it up a little bit is the education everybody needs; probably if I knew that on time, I won’t be this big.”

HPLC09: “These days I eat quite a little, when I eat a little portion of food my tummy is filled up; so, I’m getting there.”

HPLC09: "I am now educated on how to eat, how to portion my meal, what to eat you know, I'm mindful what I eat now; I didn't just stop because the dietary thing had stopped; I continued, to keep on doing what I have to do, doing this and what I've learnt from that dieting program."

CDD11: "Basically it has changed my attitude toward food; it has also changed my attitude towards eating anything or everything; and, just to realise that being obese is not the best. I used to think that BIG WAS BEAUTIFUL! But I have changed my mind (giggles). I am not that small yet, but I have changed drastically, yes!"

CDD11: "I just lost weight and I have lost habit not just weight. This is a very beautiful program; it is a very important program, if people are taught the way that I received it, you don't just lose weight, but you lose habit and once you lose habit, that's it."

CDD02: "it helped and went well. I kept at it consistently... there are so many things, before the diet I will take for granted and just take and say, 'oh it won't harm.' Now I know that every piece count."

CDD02: "I acquired another habit, of just being mindful of what I ate, ... I am still eating better than I was before the diet."

CDD02: "And I have removed sugar from my diet, that's a miracle, like sugar as in sugar, not sugar in food but sugar, processed sugar; it's off my diet now, I mean I never knew I could do without a spoon of sugar in my tea. I think that's one of the biggest things I took away from the dietary intervention."

Theme 4 - Internal program factors

Participants identified several factors that largely impacted their ability to fully comply with the dietary regime. Some of the factors identified included the structure of the dietary program and the associated instrument provided (such as the dietetic booklet, non-inclusion of African foods in it).

4a. Issues with booklets

The participants' positive experiences were often accentuated with confusion on how to translate the information in the booklet to the African food they eat, especially the carbohydrates based staple foods. There was a general feeling of being disadvantaged due to lack of information:

HPLC02: "by the time I looked into the booklet and I started thinking about the food, most of the African food we ate being unable to know the right measurement to have; since it has a lot of carbohydrates, let me clearly remove as much as I can, carbohydrates from my meal which I decided to do. But it was the booklet I looked at that also helped me frame my mind."

HPLC03: "there are times I couldn't really estimate the amount of carbohydrate. Like sometimes you cook some beans; I felt like I didn't have a proper measurement of the carbohydrate or protein in it, like sometimes I say okay I'm going to eat 'okra' soup and fish, I adjust my wheat measurement to fall within 10 and 20 grams of carbohydrates but I'm already excluding some things I put in my okra soup, maybe like the spices if they have carbohydrates because, so I couldn't really find out what quantity of carbohydrates were in spices."

The story of this participant in HPLC echoed the opinion and experience of majority of the women in the HPLC. While she was able to lose weight by mere estimating her portions, she thought having accurate measurement would have improved her weight loss outcome, as noted in this comment:

HPLC03: "you are not sure of what quantity towards; so, it's like gambling, I kind of gamble sometimes but the book really helped because at least I was able to make a menu and I lost weight. So, but I know if I had like an accurate measurement of those things, maybe I would have lost more weight."

She was particularly concerned about and lacked knowledge of the carbohydrate or calorific content of other ingredients added while cooking:

HPLC03: "it's easier if you are having a slice of bread, it's okay but in a case you have to cook the food like rice, beans or 'moi-moi' made with beans anyway, there are certain things you add to it, at the end of the day you

are not sure, you just have to have a portion, whether that portion falls into grams you are meant to eat or not. I think it is generally our kind of food; because if I take 100ml of milk I am sure how many grams of carbohydrate is in it but it's not the same with our kind of food. So that's where I got eem I kind of gambled."

HPLC03: "it is easier to calculate the amount of carbohydrates in a slice of bread or in a piece of biscuits because that is just the way you get them; but in a case you had to boil something and add other things to it and by the time it's cooked you are not sure."

HPLC03: "But whenever it comes to my native food, I wasn't particularly sure, so, it's more of a guess work; it was more of a guess work!"

4b. Non-inclusion of African food

There was an overwhelming expression of frustration among many of the participants on the lack of inclusion of their familiar foods in the dietetic booklet.

CDD02: "most of the things you gave us list were not our garri and yam and all those things I would love to eat you know; so, I was able to reduce substantially a lot on the things I would normally love to eat on a normal day, so that is, I did more of that than the calorie (giggles) counting."

CDD02: "What I am trying to put here is that, like 'if you are making garri, put one cup – one cup is so amount of calorie, I don't know. You did it, but it was mainly for the European food."

Apart from struggling with the calculation of the calorific and carbohydrate contents of African foods, participants highlighted the issue of methods of African food preparations and the non-labelling of African foods, which left the consumers in total darkness of the quantity and quality of what they are buying and consuming:

HPLC06: "... the African food is sometimes packaged in a plain bag without any, you can't see anything. Like if you look at the 'garri' you can't see

anything on the package if you are buying 'garri' and like making 'eba' with it or you are buying the 'Pando yam' or something like that."

HPLC06: "Like you buy garri and it's just packaged in a plain bag, just plain bag and there is nothing written on it or you just buy the rice, just plain bag you can't find anything written on it, like any nutritional content or something like that, to guide you. I stopped buying them because if you buy the meat from there, you can't see the expiry date, you can't see anything but if you buy any food or meat from Asda, you can see that it's going to be expired."

HPLC10: "For the African food... It was very difficult calculating that, but another thing is that with the African food because you prepare it with oil and all that, it does differ depending on who is preparing it"

There seem to be a consensus for an obvious plea to fill the gap created by the omission of African foods in the booklet offered to these participants. One participant summed this need up with this suggestion:

HPLC03: "if I were to suggest, I will bring it to you, like as I said in that booklet we have mostly the English kind of food, so if there can be room for like 'porridge beans¹²' or 'porridge yams¹³' or rice and stew, boiled, if you could have room for boiled food, spiced boiled food you know. Where I am coming from, if you are having like the 'wheat¹⁴' or 'semolina¹⁵' you have soup to go along with it; what percentage of soup and food will give you a certain amount of carbohydrate or less calories; that's the aspect I would have loved if it could be added to the program."

4c. Expense, cost and time constraints

Among other influencing factors, high costs of healthy foods, unavailability of varied healthy options and time constraints were other reoccurring sub-themes

¹² Beans cooked in palm oil

¹³ Yams cooked in palm oil

¹⁴ Wheat farina

¹⁵ Wheat farina

that emerged. Participants in both groups shared common barrier of cost and expense. However, those in CDD group perceived high cost of fruits and vegetables as a barrier while those in HPLC found protein-based food more expensive as well as fruits and vegetables:

CDD11: "the challenge I had was going through the expense. I find eating healthily is a bit more expensive. To get fruits and vegetables adequate for the day was quite a challenge. Before, I would eat anything that is on the cheap line without worrying, but now, I had to be selective and needed a lot of determination specially to share with the family. When the family don't understand what you are going through or trying to change the lifestyle for everybody. So, even changing my own lifestyle was also difficult to be part of the family in the first days and into the later days."

HPLC09: "going to the supermarket looking for the less calorie thing, checking the back; sometimes there is no time to do that."

CDD11: "what you want is not there or you can't find it, especially like I go for conferences where we just eat things like take-away because you are away from home you can't cook, you can't, and it became quite a challenge at the beginning to really find or to walk around healthier options."

One participant particularly expressed frustration emanating from cooking different meals from that of the family which she found this extremely daunting and could not stick with the stipulated dietary regime:

HPLC05: "There were a lot of difficulties. As a family person, there were problems of having to cook for other people and then find something else for myself to eat at the same time... I was eating some of the food that other members of my family were eating which did not actually help me. I was only supposed to eat food high in protein and not carbohydrate most of the time we Africans – I don't want to sound generic, I don't want to say that in general but as a family, we eat more of carbohydrates than protein, so it was a problem to me."

6.3.3 Post-Intervention Themes

The post-intervention theme encapsulates participants' experiences following the cessation of the dietary intervention. A range of lived experiences post-intervention were shared by participants, which include challenges and triumphs, such as adherences, lapses and weight regain. There was also evidence of lifestyle and behavioural change adopted by participants. This was captured under three major themes and sub-themes as shown in figure 6.6 below:

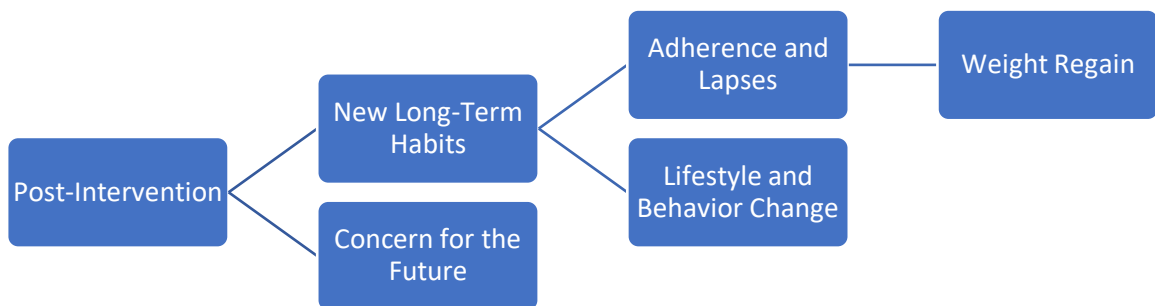


Figure 6. 6 Post-intervention themes

Despite some noted challenges post-intervention, participants' narratives of notable milestones achieved post intervention were heart-warming to listen to. Some of the participants seem to have, in time, acknowledged that the changes that have taken place in their lives were necessary and ongoing; hence their determination not to return to their previous unhealthy lifestyles.

6.3.4 New long-term habits

1a. Adherence and lapses

Participants expressed satisfaction with their ability to adhere to a healthier lifestyle since the intervention ended, making better choices with regards to what they eat and drink:

CDD02: "I haven't kept to, completely onto it but a lot more careful about the size of my diet, the kind of food that I eat and then I have added a few pounds from the last time you weighed me, but I eat healthier I am a lot more aware of what I put in my mouth and I'm trying to tell my kids the same, just to enforce it within the house.

I drink a lot of water now; I take a lot of fruits now – I fill my tummy now with water and fruits. And I could resist a bar of chocolate now, when I dish out food for myself it's always very small."

1b. Weight regains

Despite the new positive habits identified, participants also expressed specific concerns about regaining the weight lost, with fear of lapses highlighted:

HPLC03: "One thing I have learned is keep small portions. Then one challenge I'm having now is that I've gone back to school, studies and sometimes I get hungry, I feel like nibbling things, so I started gaining weight because of my situation."

HPLC03: "No, no I'm not happy really because I feel I may go back or add back the weight, so I'm just thinking how to maintain my weight; I've given out my old clothes, so I wouldn't want to start buying bigger clothes again. I'm not happy but now, I don't know what to do."

1c. Lifestyle and behaviour change

Increased self-awareness facilitated the women's abilities of introspection which allowed them to effect some positive changes and to monitor their own behaviour

towards healthy lifestyles. Series of changes made, and new behaviour acquired were listed:

HPLC04: "the program has influenced me to change my diet. I know I'm not keeping to that diet plan since after the program but at least it has affected my diet, like I eat more of protein and I'm conscious of like eating more of vegetables and taking less of carbohydrates. So, I have not really gone back to my normal, initial weight before the program, I'm still coping to keep on with my weight loss."

HPLC06: "Actually I haven't taken any measurement but from what I wear, I feel I'm still keeping up. I do exercise, I go to the gym, so I am happy. I don't take more of carbohydrate, I mind what I eat and I'm more conscious of what I eat, I don't take chocolate now, I don't even buy them but before the program, chocolate was part of my diet now I don't eat them because I don't want to get too much sugar in my diet."

HPLC10: ". One other thing I was able to curtail was bread, it made me realise that bread was not my friend; I'm very conscious of white bread now, sandwiches and I am very conscious of what I eat, especially carbohydrates now."

HPLC10: "I think I now know how to select my food when I am out there, to select more of proteinase food and food with less carbohydrate in it."

CDD03: ", sometimes I go back to normal and at other times, I say to myself – you have to do this, you have to do that. Like when my children's school is on holiday, it is more challenging because you will be giving them food – morning, afternoon, night."

HPLC02: "I developed a better eating habit. I started eating healthy, I started looking at what I was eating; I became more conscious of my food, my food intake and I noticed I had lost some weight, as if I became lighter"

CDD11: "when you said we are going to meet in October, and we are going to self-do without being followed up. I think that was the most powerful time, it was a decision-making time, it was a personal life time when no one

is saying to you anything; it's like have you caught the core concept? It was a time to take a decision to act on the concept."

CDD11: "I did follow on and I am still following on; though I am not like religiously, religiously following it

CDD02: "I have removed sugar from my diet, that's a miracle, like sugar as in sugar, not sugar in food but sugar, processed sugar; it's off my diet now, I mean I never knew I could do without a spoon of sugar in my tea. I think that's one of the biggest things I took.

One participant from the CDD group admitted going back to her previous dietary lifestyle. While she noted she would have loved to continue, she lacks the motivation to do so.

CDD07: "I kind of left things behind, I didn't really continue with it as I would have loved to, so it was more of lapse; I just went back to what I used to do before really. I didn't really have the motivation to continue."

6.3.5 Concern for the future

When discussing the future, participants from both dietary groups expressed concerns and fears of the unknown with regards to weight loss and maintenance. A recurrent concern expressed by HPLC participants were the limitation of the dietetic booklet and non-inclusiveness of African staple foods in the booklet given to them, citing examples of the type of information they would like to see in the booklet; as demonstrated below:

HPLC03: "Like as I said, in that booklet we have mostly the English kind of food, so if there can be room for like 'porridge beans ' or 'porridge yams ' or rice and stew, boiled, if you could have room for boiled food, spiced boiled food you know. Where I am coming from, if you are having like the 'wheat ' or 'semolina ' you have soup to go along with it; what percentage of soup and food will give you a certain amount of carbohydrate or less calories; that's the aspect I would have loved if it could be added to the program."

One participant from the CDD group however, indicated she would've had a more positive experience and outcome, if ready-made meals were provided:

CDD02: "I would have been happier if I got the meals, I would stick to them, and my discipline would have been more because I tried, I had to stop tasting the food I was making for my kids, because from tasting, the next thing is that I would want to eat it."

Although participants indicated they had lost weight and learned new habits, they expressed uncertainty and doubts over their ability to maintain their new- found habits and path to healthy living, following the cessation of the intervention:

HPLC03: "One thing I have learned is keep small portions. Then one challenge I'm having now is that I've gone back to school, studies and sometimes I get hungry, I feel like nibbling things, so I started gaining weight because of my situation."

In addition, participants appealed for a follow-up program of similar dietary intervention with adaptation of the dietetic booklet to suit the needs of African women or population:

HPLC02: "It was quite a very good experience and it's been a very good thing and I will encourage and comment that maybe it can be developed further and given out to African women so that they can help, it'll really help them."

HPLC05: "how do you go on from here? What's the next step for us from here? I don't know whether you have something for people again after this or what advice will you give us that have gone through this?"

HPLC05: "... for me I didn't achieve my aim. I don't know, is there any program that we should look forward to maybe in the next few months, years, I don't know?"

Theme 7. Cultural Aspects

The theme on culture cuts across the entire spectrum of the study and was not limited to any specific timeline or dietary group. There seem to be a strong presence of culture— be it family norms, food preferences, eating practices or beliefs systems— throughout the experiences of the participants. One outstanding aspect of culture that was pronounced was the changing norms surrounding obesity among participants across the dietary groups.

7a. Changing norms around obesity

There was a consensus and reoccurring theme that emerged from participant's responses that suggested changing culture and unacceptability of obesity as a norm. Moreover, they were evidence of significant shift in mind-set away from positive acceptance of obesity towards rejection of it. The dissatisfaction toward excessive body weight and shift in mind-set expressed by participants is represented in the quotes below:

CDD11: "in my culture if you are big, that means everything is good, like you are living good, like good-living. Yet when I discovered it wasn't good-living, someone saw me and said whoa you are living good because you've got enough food to eat; but if you change your mind to eating healthy, it doesn't mean that you are not healthy. So, big is not beautiful meaning that the culture, something about the culture is changed within me. I now realise so many people that have got the problems that I used to have, and I am thinking, 'no you are not beautiful actually, you are beautiful, but you need help.' I can actually identify people that need the same help that I got from this program."

CDD11: "Basically it has changed my attitude toward food; it has also changed my attitude towards eating anything or everything; and, just to realise that being obese is not the best. I used to think that BIG WAS BEAUTIFUL! But I have changed my mind (giggles). I am not that small yet, but I have changed drastically, yes!"

7b. Significant others and media influences

Participants reported being pressured by family member, colleagues and more importantly the perception of slimness as ideal image choice of everyone, a perception that may have been influenced by the role of media:

HPLC09: "Where I work, everybody wants to slim down because it's Summer coming, and everybody wants to look good, wants to be healthier, so everyone is on diet, so I won't be the scape goat, so I joined the train you know."

CDD02: "Oh men! I had lot of support, serious support from my family because all my siblings are slim... in a nutshell, they always tell me 'you have to lose weight, you have to lose weight,' I mean. And they are more concerned about my health than anything else."

CDD07: "I really wanted to lose weight and there were a lot of people in my ear telling me that I was too big and that I needed to go on a diet"

7c. Increased awareness

Across the groups, there seem to be an increased awareness and notable evidence of change in mind-set and personal growth that occurred in the process of the study. There was a sense of satisfaction expressed from participants detailing their newly adopted behaviours and the changes that occurred:

HPLC04: from the experience I've like changed my diet, it has really helped me, I now take more of protein and vegetables

HPLC04: "Very useful, at least I am aware now, actually I am conscious of and I have to be careful of what I take, so I normally check food, anytime now I buy food I check all those contents."

HPLC05: ". It has actually helped me to think more about my weight and to actually find ways of reducing my weight because I know it's something that is possible for me to do and I'm still trying to you know, I'm actually minding the kind of food I eat, just to help."

HPLC05: "I'm trying to do that now. Trying to reduce carbohydrate because I realize that carbohydrate is one of the main causes of weight and the kind of food, we take is just carbohydrate I would say."

CDD02: ", it helped and went well. I kept at it consistently... there are so many things before the diet I will take for granted and just take and say, 'oh it won't harm.' Now I know that every piece count."

6.4 Discussion

Chapter 5 focused on the quantitative aspect of the dietary intervention feasibility study, assessing the effectiveness of the intervention through the primary outcome of weight loss. The findings revealed that obese African women in NE Scotland recruited in this study can lose weight using these two diets; however, the weight loss achieved were relatively poor when compared with other studies investigating HPLC and CDD (Dyson et al, 2007; Westman et al, 2007; Volek et al, 2009; Krieb et al, 2010).

In the qualitative phase of the study, post-intervention telephone interviews were carried out on twelve selected participants to gain insight into their overall weight loss experience, and to understand key factors that may have influenced their weight loss outcome and if there were any sustained changes in behaviour.

Seven key themes emerged from the qualitative findings, namely: (1) readiness for weight loss, (2) external factors, (3) internal human factors, (4) internal program factors, (5) new long-term habits, (6) concern for the future, and (7) changing norms around obesity. The themes derived from these interviews were grouped into three broad categories based on the timeline of the study: pre-intervention themes, during/within intervention themes, post-intervention themes, and finally, a cultural aspects theme, which cuts across the spectrum of the study timeline. Selected key findings are discussed in view of the study objectives and linked to existing literature to demonstrate the study's significance and its contribution to knowledge. Where applicable, quotes from participants are introduced during the discussion, to clarify and aid any argument raised.

6.4.1 Readiness for Weight Loss

The readiness for weight loss theme encompassed participants' opinions and views about changing their dietary habits and factors that influenced their decision to embark on the weight loss program. It was pivotal to explore if the more successful participants were already contemplating weight loss and had set targets ab-initio.

Participation in any dietary program, either to embark on or maintain weight loss is a complex process and is influenced by varied factors. To better promote effective healthy nutrition in adult population, better understanding of the determinants of their behaviours and change of such behaviours are necessary (Doerksen and McAuley 2014). Several behavioural theories attempt to explain factors that contribute to embracing new behaviours, such as theory is the Bandura's Social Cognitive Theory (SCT) (Bandura 1986 and Bandura 1997) which has been utilized broadly in predicting health behaviours as well as eliciting behaviour change (McAuley et al 2003; Saksvig et al 2005), Transtheoretical model (TTM), that view behavioural change as taking place in five-stage continuum (pre-contemplation, contemplation, preparation, action and maintenance) (Povey et al, 1999; Noia and Prochaska, 2010) among others (See Chapter 1, section 1.6 for details of some popular behavioural theories).

Participants' pre-intervention phase experiences of dietary change observed in this qualitative study is congruent with the stages of the TTM model (Povey et al, 1999; Noia and Prochaska, 2010). For example, the responses to the embarkment question demonstrated that most of the participants were already contemplating losing weight before the study was introduced to them. Based on their responses, it was evident to see that participants in this study featured in different stages of the TTM - with some in the contemplation stage and even at the preparation stage, given that they had already started making moves to embark on some form of weight loss program before they were approached.

Several reasons were cited as motivation for wanting to lose weight, such as health and health concerns, image and image concerns. These findings are crucial as factors that influence initiation of acute weight loss can also be instrumental in weight loss maintenance (Barnes et al 2007). Health and image concerns as motivation for weight loss confirm much of the existing knowledge regarding

weight loss experiences (Barnes et al 2007). Similar to the African American women in Barnes et al's study, the women in this study comprised of individuals who had experienced successful and/or unsuccessful weight loss maintenance, citing health and appearance as motivation to lose weight.

The findings further demonstrated that women of African descent are well informed about the implication of obesity and obesity-related illnesses, hence the frequent mention of health concerns in nearly every interview. As captured in the comments below, most participants knew that unless they undertake some lifestyle changes, their health will likely be compromised and as such, were desperate to do anything to lose weight. The readiness to take actions by these participants about their weight based on perceived susceptibility, severity and recognition of the associated benefit of acting so, as to avoid such risks associated with obesity are all congruent to the HBM core constructs' and highlighted below:

HPLC05: "I just wanted to reduce it, because I know that no matter how much weight I reduce at that time, it will be good for me. At least it helps to prevent further occurrences of other sicknesses in my body."

CDD02: "So, it was for my health....to be healthy, to be healthy, to get myself to a healthy weight, and bring my weight down really. And then, yeah for my health basically."

CDD03: ".... also, fat can also cause so many diseases, that's another reason to go on diet."

It also emerged from this study that contrary to previous literature that reported African women as more accepting of big-body form (Puoane et al, 2005; Faber and Kruger, 2005; Millstein et al, 2008; Robinson, Webb and Butler-Ajibade, 2011) and are less likely to be pressured to lose weight (Zullig et al, 2006; Millstein et al, 2008), participants in this study unanimously were dissatisfied with their appearances post weight build-up. They were eager to regain their 'normal self', 'connect with their former self,' look smart, and have their clothes fit well, with one participant expressing a feeling of disgust for her 'bulging tommy and arms'.

More so, findings revealed not only physiological but also psychological and mental impacts of being overweight or obese as illustrated here:

HPLC04: psychologically, I wasn't feeling good with myself, I need to connect with my former self. If I put on weight, I'm looking like someone else, to me it's not good for me, like mentally it affected me.

Although assessment of psychological and mental health impact of obesity was beyond the scope of this study, it's certainly will be an important area to explore in a larger scale study of this type, with similar population in the future. This is crucial as previous studies suggests obesity does not only impact physical health but also psychological health, that encompasses depression, anxiety, body dissatisfaction, and self-esteem (Wardle et al, 2005; Kim et al, 2007 and Luppino et al, 2010).

Furthermore, another striking finding was participants' association of their development of obesity or excess weight gain to migration to the United Kingdom, as captured from this participant:

HPLC04: I have put on weight; before coming to do PhD, I wasn't as fat as I was when I started the program. So, I wasn't happy with my weight then."

Similar views were expressed among participants during the focus group that preceded the feasibility study (see Chapter 5). Participants from the focus group, as well as the interviews, both blamed the Western diets, the inaccessibility and the unavailability of most African food they are used to, as contributory to their excess fat accumulation. These findings do suggest a pattern among this population and an interplay of environmental factors in the development of obesity amongst this group that might require further investigation

Other difficulties encountered include how to calculate calorific content of African foods, how to determine food portions, finding daily recording in journal tasking (if this was mentioned in the interview, explanation was given to the participants that this was just a tool for data collection and not a general requirement for following the diet) and struggling with implementing diets due to social and family network influence. For instance, some of the participants noted not following the diets when they had visitors, during parties, and outings with family, as well as during festive periods such as Easter.

6.4.2 External Factors

The peculiarity of African diets and social gatherings are two key external factors that may have influenced the outcome of participants' experiences. The discussion on external challenges revealed the importance and meaning of food to this population. It was evident that participants retained a strong attachment to their traditional food, even while in diaspora. Participants identified lack of variation of and unavailability of diverse African foods as a barrier. Some participants, especially those in HPLC viewed the new diet of mainly protein and vegetables as very expensive, in comparison with the calorie-dense and high carbohydrates diets they were accustomed to. Hammarström et al (2014) also reported similar findings in their study with a participant leaving the study for too little variation of their prescribed diets and high expense of proteins and vegetables (Hammarström et al 2014).

Several of the participants struggled with compliance with the diet due to social and project-related difficulties. Drawbacks identified with social relations were comprised of struggles to keep up with the prescribed diets when together with friends and family. In some cases, some of the participants devised strategy to make different meals – one for the family and another for themselves, howbeit, not all participants could cope with this:

CDD02: "It was not an easy task at all. Having to manage the family food, as well as mine by the side, juggling jobs and all that, it wasn't easy." One participant who gained weight identified this as a major obstacle to weight loss and confessed she nibbled at and ate from the family meals most of the time. Time constraints to make different food for self and family was another major challenge identified as captured here:

CDD02: "the fact that one is a family person and you have to cook for people all the time; that was actually a problem for me because I find it difficult to cook; maybe because of the time – one could get busy at times cooking for the whole family and the time you have to find your own kind of food to eat might not be there."

Social gatherings were also identified as possible barrier to weight loss. Participants described feeling isolated or guilty if they went to a party and did not

partake in the meals provided, which are usually not healthy. Others feared retributions and gave up their dieting during these events to avoid answering questions from or offending friends:

HPLC03: "if I went for a party and my friends are having food, having drinks, you know, if I say I will just go for water and a little meat I don't want rice, they will say, 'why, why are you doing that, are you okay?' So that's, those were typical situations where sometimes I just tried to keep dieting aside so that people don't ask me, though I tried to keep to small portions, but I try to take what I would have taken ordinarily. So that was the only particular issue that I have."

Findings on the influence of societal and family pressure is not peculiar to African women, as Hammarström et al (2014) reported similar findings while investigating barriers and facilitators to weight loss in a dietary intervention among women in Northern Sweden. However, the striking difference in these findings is the overwhelming support participants garnered from their spouses while some of the women in Hammarström et al (2014) study noted their partners as major obstacles, who did not care about their new diet and tempted them with forbidden foods. The case was different in our study, as the African women were mostly pressured to lose weight by their spouses and other family members. And in some cases, encouraged their weight loss by participating in their new diets. This finding is an indication of a growing shift from a more acceptance of larger body sizes (Grabe and Hyde 2006; Breitkopf et al 2007) to less acceptance and dissatisfaction with body image among obese African women (Duda et al 2007; Nenkeser, Biritwum and Hill 2012). One interesting aspect of the findings from this study which has not been previously reported is the indication of increased pressure on the African women to lose weight from colleagues, friends and more importantly, from close family members.

Furthermore, our finding mirrored Hammarström et al (2014) study in that some of the participants found it easier to stick to their diets while at work, compared to being at home or attending social gatherings. However, some participants in this study had difficulties combining work and/or studies, family and the diets at the same time.

6.4.3 Internal Human Factors

There is evidence of significant physiological effect of the diets on participants. Common side-effects experienced, such as craving, hunger, feelings of weakness, dizziness, light-headedness and migraine, and carbohydrate withdrawal symptoms, are all congruent with findings from both quantitative (Liu et al, 2013) and qualitative (Harvey, Schofield and Williden 2018) studies. However, most of these physical symptoms abated over time and many of the participants continued with the study. Only one participant who dropped out offered feelings of dizziness as reason for discontinuation.

Despite these challenges, the overall perception of the diets was positive, and participants found it rewarding. Participants felt the benefits provided encompasses general wellbeing, health improvement, sense of being in control of their diets and less or no craving for unhealthy foods and sugary beverages.

These findings further highlighted the lack of provision of appropriate tool available to obese African women in NE Scotland who would like to lose weight. Difficulties with portion control and non-compliance with the diets were linked to not having the appropriate information on the booklet provided, such as African staple diets, their energy content and how to determine appropriate portions.

This finding is interesting because, the problem of portion control identified in this study is linked to participants not having the right information and mechanism to determine appropriate portions of African staple diets and what they constitute. This factor seems to have had a major, if not the greatest impact on participant's adherence or compliance to the diets. In a way, this finding is novel as to the best of my knowledge, this has not been reported in previous literature.

Most of the participants, especially those that lost weight reported devising some strategies for estimating portions of their traditional food they think are appropriate, since they had no clue on their calorific or carbohydrate contents.

One strategy was to reduce the portion of food they were used to eating to half, as captured here:

HPLC09: “: I didn't even use that thing as it is verbatim, I used my initiative as well..... what I did was that I know the portion of food I normally eat you

know, what I did was I cut it into half and consume, let me not say half of it, almost yeah and consume half instead of consuming the whole bowl of food.”

CDD02” ...we don’t just eat only European food; we eat our own kind of things a lot you know. I would rather eat our own food you know, so the calculation was difficult.”

This aspect of our study is insightful, as it paints a vivid picture of the struggles these participants would have had. To a significant extent, participants’ self-determination might have played a role in facilitating weight loss, for the achievers; as they would have been motivated by their desire to lose weight and decided to accept their new diets. Hammarström et al (2014) reported similar findings, identifying self-determination as a facilitator of weight loss for the achievers in their study; however, the women in their study did not have the same peculiar challenge reported or identified in this study. Hammarström et al (2014) also interviewed those who dropped out from the study, which is not the case with this study. It would have been insightful to interview some of the dropouts to determine if this challenge played a role in their discontinuation.

Providing adequate and relatable tool to these participants may have played a huge role in improving the outcome – although this was not assessed in this study, future studies should aim to incorporate this or better still, provide a culturally appropriate tool for the participants in future studies.

6.5 Summary

Participants in both interventions achieved weight loss, but the losses were modest in most cases, compared to other studies. Most of the participants were already contemplating losing weight as indicated by self-selection bias as well. They are well informed about the implication of obesity and obesity-related illnesses, hence the frequent mention of health concerns in nearly every interview. Contrary to previous literature, these women were less accepting of big-body form.

Many of the participants linked their development of obesity or excess weight to migration to the United Kingdom and saw Western diets as less conducive to maintaining a healthy weight for them. The inaccessibility of African food left the western diet as the most accessible option. However, participants also lacked a 'scientific' way to estimate calorific value, due to paucity of data and appropriate guidance, of the few available African foodstuff. Portion control was therefore an issue.

Finally, the effort to maintain a diet is not trivial as meals prepared for non- dieting family members were different and so required more time for participants to prepare both sets of meals. For busy working or studying women, this was non-trivial.

CHAPTER SEVEN: KEY FINDINGS - Contributions, Recommendations and Conclusion

This final chapter of the thesis summarises the key findings with a reflection on how these relate with and actualised the research aims and objectives.

Limitations and strengths of the study as well as its contribution to the body of knowledge will be outlined. Furthermore, a reflection of the study's implications for policies and clinical practice, and recommendations for future research will be captured. The chapter ends with summative conclusions.

7.1 Study Overview

This study was prompted by the paucity of dietary intervention focusing on obese women of African descent, living in NE Scotland. It sought to bridge the gap by answering the research question: "In African women with obesity living in NE Scotland, are HPLC and CDD diets effective and acceptable in inducing weight loss?"

The SIGN weight management guidelines for weight loss recommends a calorie deficit diet (CDD) of 600kcal/day. Alongside the CDD, another standardised diet, HPLC, is offered by obesity specialist clinics in NE Scotland, to obese individuals referred by their GP for weight management. It is reasoned that African women living in NE Scotland, are likely to be offered one of these diets as a first line of treatment for obesity if they are referred to the specialist clinic. Hence the paramount importance of assessing whether these diets are effective and acceptable in inducing weight loss in this population. The achievement of the overarching aim is demonstrated in the thesis through the results and discussions provided at different stages of the study and from carrying out the following objectives:

- To explore lifestyle choices that influence dietary intake in this population.
- To assess the effectiveness and acceptability of two dietary interventions.
- To explore with participants their lived experiences of the two dietary interventions.

- To summarise findings which could provide awareness of key factors and recommendations to best implement weight loss programmes in African women in diaspora. These are also expected to be of interest to other minority ethnic groups.

The research commenced with a focus group to explore the health beliefs, dietary preferences and how best to recruit from this population, as previous studies suggest that recruiting from this population can be challenging (UyBico et al, 2007; Robinson et al, 2007; Huang and Coker, 2010). UyBico et al (2007) and Chatters et al (2009) state that churches are important areas for recruitment for this population.

The second phase of this research adopted a sequential exploratory design of mixed methods research to assess the effectiveness and acceptability of the two dietary interventions: HPLC and CDD. The choice of these two diets, as stated previously was because they are the core diets prescribed to obese individuals referred to the obesity specialist clinic by their GP in the NE Scotland.

The dietary intervention segment involved a feasibility experimental study carried out on 33 obese women. Participants were adult females of African origin; aged ≥ 18 , with $BMI \geq 30 \text{ kg/m}^2$; not lactating or pregnant and had not participated in other dietary related studies within prior 3 months. Participants were randomly assigned to the HPLC diet (n=15) or to the CDD group (n=18) for the duration of 12 weeks. At completion, there were 10 participants in the group who received the HPLC diet and 11 in the CDDs. Reasons for discontinuation of some of the participants include inability to cope with dietary regime due to personal and family crisis, work and exam related stresses, illnesses and pregnancy.

Key measurements, including weight, height, Waist Circumference, Hip Circumference, Sagittal Abdominal Diameter (SAD) and BMI, were taken pre- and post-intervention to assess changes in weight or body composition. Food diary and reflective journals were also completed and returned electronically during the intervention. Although the food diaries could not be analysed using the WIN Diet

software due to vague descriptions and unspecific quantity of food consumed, it did yield some useful insight into the dietary engagement or practices of participants. In many cases, the descriptions of food consumed by participants indicated non-compliance to the diets, for example, some HPLC participants were consuming such food as rice, cake, potatoes, sandwiches, 'fufu', maize meal and so on. Although the quantity consumed were not indicated, majority of food listed were carbohydrates. Participants were subsequently followed up for six months with minimal contact, after which, 12 were interviewed to gain insight into their overall weight loss experience and to understand key factors that may have influenced outcome, including whether they modified their behaviour or made changes to their lifestyle.

To minimise bias that might result from shared identity, given the researcher's background as an African woman living in NE Scotland and personal experience of weight gain and search for a sustainable weight loss, a reflexive interview was carried out. The reflexive interview was undertaken following the focus group, but prior to conducting the intervention feasibility study. An experienced qualitative researcher, unrelated to the study, carried out a semi-structured interview with the researcher, using the same questions and prompts from the focus group.

The reflexive interview was primarily undertaken to enable the researcher to identify pre-held assumptions and preconceptions, acknowledge them to become aware of her own personal journey and that of the participants. Moreover, since qualitative research embodies elements of subjectivity (Cunliffe and Locke, 2016), doing the reflexive interview was a necessary step to ensure transparency— that the data collected are not contaminated— and that the feelings and opinions of the researcher did not 'colour' the opinion of the participants and her interpretation and presentation of the data.

The reflexive process indicated two potential areas of bias for the researcher. One arises as a result of the perception that 'obesity occurs as a result of personal choices, and that individuals can avoid being overweight by making healthier meal

choices. The researcher thus had to take a deliberate neutral and non-judgmental approach to asking questions of participants during and after the dietary intervention and in interpreting the participants' story during the analysis stage.

The second area concerned a belief that some participants were sympathetic to the cultural acceptability of a larger body size as being more attractive or that 'fat is beautiful'. Awareness of this potential bias led the researcher to research literatures that provided considerable information on the widespread changing attitudes and cultural shift from acceptance to non-acceptance of obesity.

7.2 Reflection on Key Findings

7.2.1 Focus group

To help inform the design of a feasibility dietary intervention study, the focus group was conducted, first, to explore dietary preferences, health beliefs and lifestyle choices of African women living in NE Scotland and how this might affect their dietary intake and influence their decision to engage in a dietary intervention. Additionally, the focus group also set out to gather information about the best approach to recruit and follow up prospective participants into the feasibility dietary intervention study. Achievements of these objective will be highlighted in the discussion below.

Findings from the focus group suggest that the participant were conversant with the ethos of healthy, lifestyle and the negative impact of unhealthy eating and lifestyle. The consensus was that participants demonstrated substantial knowledge of what constituted healthy eating and lifestyle; however, a further exploration of their account of eating habits revealed an inconsistent behaviour that inhibits translation of such knowledge into lifestyle choices. This finding correlates with other studies that examined food attitudes and eating behaviour amongst different ethnic groups, asserting that knowledge of nutrition and food risks alone, does not necessarily translate into healthy eating behaviour (Untaru 2013; Acheampong and Haldeman 2013; Swanson et al 2013).

The focus group further provided insight into participants' preference for energy dense food such as rice, pounded yam and garri , with insufficient inclusion of other classes of food, coupled with a dislike for green vegetables based on appearance and taste are interesting discoveries that reveal a barrier to healthy eating or adherence to a dietary regime that is not energy-dense in nature. This revelation of the incongruities between participants' knowledge of what represent healthy food and their actual food practices highlight the need for health promotion and education on healthy eating among this group. With numerous conflicting information in circulation and little information on African staple diets, the tendency to become confused about healthy eating is high, hence the need to provide scientifically-based nutrition information in layman's terms that can help individual from this and similar population make informed choices about their food, portion control, drinks as well as other dietary behaviours that promotes optimal health.

Other major barriers identified from the focus group were structural barriers such as the unavailability of familiar healthy foods, high cost of available healthy options and time constraints due to other competing demands. These findings align with and have all been reported by previous studies (Delisle 2010; Swanson et al 2013, Baruth et al, 2014; Ahlgren et al, 2016; Munt et al, 2017). However, it is important to understand that whereas the barriers may be similar to other populations, for the African women, these factors are influenced by the migration and the ways of resolving these issues will defer from that of other indigenous populations.

The consistency of these findings suggests that the high prevalence of obesity among African women (living in NE Scotland) could go beyond conventional factors of sedentary lifestyles and consumption of convenience food. It is essential to consider that food choices may be dependent on individuals' circumstances or the environment in which these women find themselves.

Addressing these factors warrant the need to design dietary interventions that are not generic or one-size-fits-all but are culturally tailored to meet the need of this population. For instance, dietary intervention that take into account participants food preferences might yield more positive outcome. One approach can include incorporating more acceptable, less expensive and less energy-dense Western options into dietary interventions for this population. A further area of research can be to discover locally available foods that meet these criteria.

The information regarding a unanimous discontentment of African women in this study towards being obese/overweight, as well as increased pressure to lose weight from close friends, colleagues and family members, strongly reflects the changing culture among this population. Contrary to a viewpoint commonly portrayed in the literature that African women are more accepting of larger body sizes (Grabe and Hyde 2006; Breikopf et al 2007), the finding of this current study correlates with reports of general dissatisfaction with body image among obese West African women (Duda et al 2007; Nenkeser, Biritwum and Hill 2012). These findings provide insight on the health beliefs that might influence the women's ability to maintain normal body weight or/and decision for weight loss intervention. The results of the focus group provide some evidence in the current debate about African women as more accepting of larger body weight, viewing them as more attractive.

The reflexive interview that the researcher undertook revealed her own biases that she also believed this perspective to be true. She was surprised to find that the culture is fast changing as the women in this study were less accepting their current body weight, pressured by their own discomfort and pressure from those around them and in some cases, they had started taking measures to engage in lifestyle changes. It is important that this readiness on the side of this group of women is embraced in future research on weight loss intervention to help African women achieve their ideal weight and lifestyle choices through a meaningful and relevant dietary and lifestyle coaching approach.

The focus group further sought to obtain information on the best approach for recruitment and follow-up to inform the feasibility dietary study. The information gathered in the course of exploring the best avenue for recruitment, which included pre-visits to selected church congregations in the NE Scotland, information on the population of African worshippers, informed the idea to confidently approach churches, as well as universities and various African community group meetings to recruit participants for the feasibility study. The recruitment of focus group's participants from a church congregation highlights church recruitment as one of the best ways to reach out to this population.

These recruitment considerations involving approaching participants in their familiar environment (place of worship), may have instilled some level of comfort, confidence and trust by participants. This finding supports previous studies that suggests approaches for recruiting through partnerships with churches and community leaders among others (Swanson and Ward 1995; Campbell et al 2007; UyBico et al 2007; and Chatters et al 2009). The limitation of recruiting from churches, include exclusion of non-church goers, however this was mitigated during recruitment for the feasibility dietary study by incorporating other avenues of possible recruitments identified, such as the universities, communities, word of mouth.

The preference for remote monitoring instead of the conventional face-to-face monitoring was another highlight of the focus group findings. Time constraints, family and work pressures, childcare issues among others were reasons cited for this preference. These factors were taken into consideration in the planning and design of the feasibility study to maximize recruitment and retention rate among participants.

In summary, for a dietary intervention in this population to have a high likelihood of success, it should recruit participants from those places where the African diaspora community tends to congregate, the church being a major player in this

respect. It should also emphasise virtual follow-up over face-to-face ones, to help participants better balance other competing pressures (work, family, education).

Moreover, the findings from and analysis of the focus group informed the modification, reframing and restructuring of the post-dietary interview questions to better elicit relevant information that answers the primary research question of how to effectively achieve sustained healthy weight in African women in diaspora. As earlier stated, the process of analysing the focus group and eliciting salient key messages further brought to light the need for the researcher to examine and mitigate any potential bias that might result from personal experience as an African woman in diaspora; hence, the adoption of reflexive interview methods (detailed in chapter 4) prior to conducting the post-intervention interviews.

In summary, the rationale for conducting the focus group and objectives were met and subsequently informed the dietary feasibility study by:

1. Informing recruitment strategy - enabled the researcher to identify the locations to successfully recruit.
2. Informing planning of the intervention study – identify convenient time for participants and preferred follow-up strategy in order to reduce attrition.
3. Informed the modification, reframing and restructuring of the post-dietary interview questions to better elicit relevant information that answers the research questions. For example, most of the questions in the focus group prompts were 'what questions,' such as, "what are the things that make it easier or more difficult for you to have a healthy diet?" Whereas in the post dietary interviews, more open-ended questions were utilized such as, "Tell me your overall experience whilst on the diet;" "How did you find the diet on a day to day basis?" "How did you manage these experiences?" The later format allowed for broadening of the range of answers provided and reduced channelling, which may close out areas not previously thought of by the researcher.
4. Informed further measure to mitigate bias (viz. reflexive interview).

7.2.2 Dietary Intervention

In the feasibility intervention study, participants were randomly assigned to either a HPLC or CDD diet in order to assess the effectiveness and acceptability of these two diets. At the end of a 12-weeks dietary intervention, the two dietary approaches had similar effects on weight loss on obese African women living in NE Scotland. The findings revealed that women recruited in this study can lose weight using these two diets; however, overall, less weight loss was achieved when compared with other studies (Samaha et al 2003; Halyburton et al,2007; Rolland et al, 2009; Volek et al 2009; Krebs et al 2010; Tobias et al 2015) which used similar diets.

In this novel study, it was hypothesized that obese African women living in NE Scotland will experience greater weight loss in the HPLC than those in the standard CDD at the end of 12 weeks, similar to findings from a similar study carried out on Chinese women (Liu, et al., 2013) The mean weight loss was slightly higher in the HPLC (2.95kg) than CDD (2.27kg) group, with at least 3 participants from the HPLC group achieving a significant >5% weight loss in comparison to only one participant achieving the same in the CDD group. This finding suggests that the two dietary approaches, when adhered to for 12- weeks, will produce similar outcomes. However, the mean weight loss observed in this study was much less than those reported in previous studies (Samaha et al 2003; Sondike et al 2003; Brinkworth et al 2004; Krebs et al 2010; Tobias et al 2015); that reported greater weight loss with lower carbohydrate intake than a low-fat, high carbohydrate diet (Tobias et al 2015; Stern et al, 2004; Samaha et al 2004).

Also, completers of the two dietary interventions and the base observation carried forward analyses gave very similar results, confirming that the base observation carried forward (BOCF) approach did not cause over- or underestimation of the diet effect. It was also clear that completers' analysis, apart from showing the same or even more pronounced changes, did not always give statistically significant results due to the small sample size.

Overall, adherence to the HPLC and CDD is likely to induce some level of weight loss in this group of African women, albeit lower than what has been reported in previous studies with other sub-groups. Many of the participants were not successful in losing >5% baseline weight. The HPLC diet did not produce a considerable amount of weight loss comparable to previous studies involving HPLC diets (Halyburton et al, 2007; Dyson et al, 2007; Westman et al, 2007; Volek et al, 2009; Krebs et al, 2010; Gunnars, 2017). Plausible explanations for this outcome are inadequate knowledge of the diets, participants' lack of motivation or high cost/expense of high protein diets (Hession, 2009). However, culturally tailoring these diets to the needs of this population (Osei-Assibey and Boachie, 2012) and perhaps allowing participants a choice of their preferred diets, may have improved outcomes. Yancy et al, 2013 suggests that allowing participants choose their preferred diets enhances adherence and promotes weight loss.

7.2.3 Post-intervention Interviews

Post-intervention interviews aimed to explore with participants their lived experiences of the two dietary interventions, to gather information on the acceptability of the two dietary interventions.

The study revealed that as participants were contemplating weight loss before they were approached to join the study, they were knowledgeable and aware of the impact of and comorbidities of obesity. This awareness informed their willingness to embark on the dietary intervention. Contrary to previous literature that reports African American women as more accepting of larger body ideals (Gordon et al, 2010), finds curvaceous body type more attractive (Overstreet, Quinn and Agocha, 2010) and unwillingness to lose weight for concerns of losing their curves (Baruth et al, 2014), the women in this study were less accepting of big-body form, echoing similar findings from the focus group, despite many of the women interviewed were not part of the focus group.

Participants linked the onset of their obesity to westernisation (newly acquired western diets and lifestyle) and lack of accessibility to African foods. It will be interesting to investigate this claim in future studies, as the process of weight gain or dietary change may have commenced prior to migration. Moreover, participants lacked knowledge on how to estimate calorific value, due to the lack of information and appropriate guidance on the accessible African foods. Portion control was therefore reported as a big issue as participants could not determine the right portion size appropriate for their diets. Most participants, especially those successful in losing weight, reported devising strategies for estimating portions of their traditional food such as reducing the amount or halving their normal consumption.

Significant barriers were encountered by the participants that would have influenced effectiveness and acceptability of the diets. Lack of provision of appropriate tools was a huge barrier identified. Difficulties with portion control and non-compliance were linked to unavailability and non-inclusiveness of appropriate or relatable information in the dietetic booklet provided, such as African staple diets, their energy content and appropriate portions. This factor may have had a major, if not the greatest, impact on participants' ability to adhere to the assigned diets. Majority of the participants reported struggling to comply because of the lack of information specific to this ethnic group.

Extensively, participant self-determination/self-efficacy and readiness to lose weight contributed to the successful outcome in those that achieved some weight loss. This finding is consistent with the findings of Hammarström et al (2014), who identified self-determination as a contributory factor in facilitating weight loss among Swedish women who were successful in losing weight. Although the participants in Hammarström et al's (2014) study did not share the same challenge as the women in this study, this finding reveals the determination on the part of participants to overcome the barriers and embrace their new dietary regime.

Societal relationship and family pressure to lose weight reported in the focus groups was also identified as a factor in the post-intervention interviews. Ryden and Sydner's, 2011 study highlights importance of social text in influencing change in dietary process. He posits that adherence to dietary change is determinant by social relationship within and outside the household (Ryden and Sydner, 2011).

Similarly, Ahlgren et al, 2016 revealed a major obstacle experienced by women in their study – which was their partners' refusal to accept their new diet, hence, they had to prepare two meals (Ahlgren et al, 2016). Other studies have reported similar assertion that when women are engaged in dietary change, members of their household do not automatically follow their diets (Hammarström et al, 2014; Brown et al, 2012), with the reversal being the case when the husband has to change his diet (Ahlgren et al, 2016).

Although Hammarström et al (2014) report on Northern Swedish women struggle to cook two different meals aligns with the finding in this study, the women in their study did not receive any support from their spouses, who were viewed as constituting barriers for adhering to their diets because they did not care about their new diet and tempted them with forbidden foods; unlike the African women in this study who reported overwhelming support by significant others and family members, who in some cases volunteered to participate in their new diet, as earlier discussed under external factors (See section 6.4.2). This finding further supports evidence of the growing shift away from more acceptance of larger body sizes among obese African women, and their spouses.

Significant physiological effect of the diets on participants were reported at the early stages of the study, such as craving, hunger, feelings of weakness, dizziness, light-headedness, migraine and other carbohydrate withdrawal symptoms, particularly among the HPLC group. However, only one participant who discontinued from the study stated that feelings of dizziness was a reason for discontinuation, indicating that these physiological effects of the diets were not

the main determinant of participants continuing in the dietary intervention in this study.

Despite the challenges noted, the overall perception of the diets was positive, and participants found it rewarding. They felt that the benefits of enhanced general wellbeing, health improvement, sense of being in control of their diets and little or no craving for unhealthy foods including sugary beverages were worth the 'sacrifice'. This indicates acceptability of the diets, suggesting that if the barriers associated with the diets such as non-provision of appropriate information on African staple food is provided to this population, their adherence and acceptance of these types of diets will be enhanced.

7.3 Originality and Contribution to Knowledge

The burden of obesity and its related comorbidities among African women in the UK has been documented and remains a pertinent issue. A modest weight loss of 5-10kg has been shown to ameliorate such comorbidities (Hill and Kris-Etherton, 2008). However, evidence suggests that African women underachieve in weight loss intervention compared to Caucasians (Svetkey et al 2005 and Befort et al 2008), hence the search for effective weight loss intervention becomes paramount. Unfortunately, there is currently a lack of research on dietary interventions for weight loss that best suited to these populations in diaspora (Osei-Assibey and Boachie 2012). It is not enough to assume that diets used in the UK will meet the needs of this subgroup.

Several dietary interventions have been carried out in the bid to address the impact of obesity on this target population, as demonstrated in the systematic reviews by Osei-Assibey and Boachie (2012) and Fitzgibbon et al (2012). However, evidence points to paucity in the use of HPLC diets in this population, despite its increasing popularity in the recent past and evidence of efficacy, especially among the Caucasian population. This study offered therefore an opportunity for this diet

to be tested on the African women residing in NE Scotland where the HPLC and CDD is currently prescribed as the standard plan for management of patient referred to the Specialist Obesity Clinic, thereby, filling in that gap.

The original significant contribution to knowledge and novelty of this study, stems from its adoption of a pragmatic paradigm of mixed method sequential explanatory design, to elicit valuable data that enhanced the understanding of the lived experiences of obese African women prescribed to CDD and HPLC dietary programs. The robust design of mixed-method approach to this study provided a holistic view of the journey of African women prescribed to these two dietary interventions. On the one hand, while providing answer to the effectiveness of such diets in inducing weight loss within this population, it also yielded further insight into factors that positively impacted their dietary journey, likewise barriers that may have hampered their achievement of the desired weight loss. Hence, providing new and unique perspective to the phenomena; novel contribution to knowledge by means of the participants' lived experiences, that will be beneficial in informing future large-scale study in this and similar populations.

Additionally, the incorporation of reflexive interview to enable the researcher to identify pre-held assumptions and preconceptions that could affect interpretation of data, was a necessary step to ensure transparency. The reflexive interview allowed the researcher to bracket the identified preconceptions and assumptions, further ensuring that the data collected were not contaminated; and that the feelings and opinions of the researcher did not 'colour' the opinion of the participants. This process and learning from the reflexive interview were contributory in enhancing data collection, analysis and presentation of the findings as discussed in detail under the discussion section of the reflexive interview chapter 4. (see section 4.5); however, a few examples on how the reflexive interview impacted the study are outlined below:

Recognising inherent biases enabled the researcher to be aware of her assumptions and to take appropriate measure to maintain a neutral position, during the post-intervention interviews sessions as well as the analysis and interpretation of the data. These measures include reframing the interview to

include more open-ended questions so as not to restrict or influence participants responses to questions or leading them to state similar experiences to that of the researcher. These lessons had a positive impact on how the researcher conducted the interviews. She was measured in her words, listened more to the participants, gave ample time for answering questions and gave appropriate prompt without leads.

Researcher's insight into her own story and journey enhanced her understanding of this group of participants as she could easily relate with the struggles and experiences that are similar in many cases. For instance, these group of women had few things in common – their struggle with excess weight, mothers who are working and or studying in addition to other competing demands. Their obvious struggles sometimes evoked empathy towards the participants that came through in the non-judgemental approach and silence that punctuated the interview sessions. In turn, participants were confident to relate with researcher as a fellow 'African woman in diaspora' therefore were more forthcoming with their answers and shared information that otherwise would have remained uncovered.

The assertion above highlights the insider-outsider researcher's dilemma identified by other researchers working in black and minority ethnic communities (Serrant-Green, 2002; Serrant-Green, Hylton and Ochieng, 2010). Insiders are considered part of the community they are researching whereas outsiders are viewed to be outside of the group researched (Hellawell, 2006). In several ways, the researcher was viewed as an "insider," whom the participants considered as one of their own, believed to understand their struggles, stories and can relate with their experiences. As a researcher, these identities (ethnicity, gender and experiences of struggling with weight issues) that she possesses may have endeared her to the participants placing her in an advantageous position as an 'insider'. Even though participants were all women of African descent in diaspora and had shared experiences of weight loss struggles; not all the participants were Nigerians or were in the same social economic group with the researcher. On the contrary, it can be argued that the researcher's identity as a professional in the field, academic exposure and familiarity with the research topic further sets her apart and may have placed her as an 'outsider'.

Hellawell (2006) and Berger (2015) posits that the researcher can move in a continuum between facets of an 'insiderness' and 'outsiderness' as the research evolves. However, whether the researcher is considered an 'insider' or 'outsider' and on what elements of identity this is judged, is ultimately determined by participant or the group that is studied (Dwyer and Buckle 2009).

There are however benefits and drawbacks associated with being either an insider or an outsider within a research. Key benefits of being an insider researcher includes easier access to the researched populations, especially those of marginalised communities (Yakushko et al, 2011; Hayman et al 2012). Also, it enhances already-built rapport with participants; familiarity with participants' language and norms (Brannick and Coghlan, 2007) that makes it easier for the researcher to access the participants and be more acceptable by the participants (Dwyer & Buckle, 2009; Berger, 2015). Being considered an insider instils trust in the participants that the researcher can represent their story, hence they are more inclined to opening to sharing their stories which in turn provide richer data (Dwyer and Buckle 2009; Berger, 2015).

Several drawbacks of being an insider were identified as conflict with maintaining one's role as a group member as well as a researcher (Brannick & Coghlan, 2007; Dwyer & Buckle, 2009). Brannick and Coghlan (2007) argues the insider position inhibits researcher's objectivity as they are too close to the participants or research topic (Brannick and Coghlan, 2007). Also, being an insider is further argued to have the potential to influence the structure of the research questions and interviews, based on researcher's own experiences, hence not giving room for flexibility to the unique experiences of participants (Brannick & Coghlan, 2007; Dwyer & Buckle, 2009). There is potential for presumption due to shared similarities between study participants and the researcher, hence failing to explore or provide detail information during data collection, thereby inhibiting thorough analysis (Couture et al, 2012; Berger, 2015).

Besides, this process was useful and applicable during the analysis and interpretation of the post-intervention interviews. Utilising the lessons from the LG second reading (see Chapter 4, section 4.4.2), the researcher was able to relate with participants experiences, uncover their voices while cognisant of hers, identified through the process of the "I" phrases and other personal pronouns. This

was beneficial during analysis as it serves as a trail of evidence of self- disclosure, providing the researcher with deeper understanding of herself and identities, which in turn enabled her offer unbiased meaning/interpretation to participants' stories to a reasonable extent.

Overall, the benefit of being a member of the researched community (insider-researcher) can be said to have outweighed any drawback; as the rich data generated at the end of the study, may have been facilitated by the instilled trust on the researcher as 'one of their own.'

On the whole, this present study design stands out from other dietary intervention studies in the literature investigating HPLC diets (Brehm et al, 2003; Dansinger et al, 2005; Gardner et al, 2007) and it is the first dietary intervention study in this population utilising such a robust method incorporating the qualitative segment of understanding participants' experiences during and with the prescribed diets. The findings from these experiences of the participants on the diets offers potential benefits of understanding this phenomenon and can facilitate development of culturally tailored future interventions that considers the specific needs of this population.

7.4 Recommendation and suggested future work

Below are some recommendations and suggestions for the future work, with regards to this study. First, this present study was designed as a feasibility study and its findings could inform a larger intervention study that would provide a more robust conclusion about the effectiveness of the HPLC and CDD among healthy obese African women. Hence, the findings from different components of this study should be considered accordingly when designing such intervention.

Secondly, the duration of this study was short (12 weeks of dietary intervention), future trials should consider longer duration of at least 6-months dietary intervention, reflecting Brehm et al, (2003) trial on healthy but obese women, where weight loss difference was statistically significant at 6 months with an average (low-carb group 8.5kg vs. low-fat group lost an average of 3.9 kg).

Thirdly, it will be insightful to consider following up with participants in the traditional face to face method, instead of remote methods used in this study, to investigate how and if professional support will enhance outcomes of lifestyle interventions in this population.

Fourthly, future studies should also consider inclusion of anthropometric measurements at the end of the follow-up period to compare with baseline and post-intervention measurements, in order to assess if participants maintained the weight loss or regained it. This will further enhance the understanding of adherence to these diets and weight maintenance in this population.

Fifthly, although the discontinuation rate of this study was comparable to other studies (Samaha et al, 2003) and relatively modest when compared to another study that experienced 66% dropout (Gryka, 2011), it will be beneficial to investigate if allowing participants to choose their preferred diets, could enhance adherence. This aspect is important as majority of participants who discontinued

indicated lifestyle issues as justification for withdrawal. Offering participants, the freedom to choose their preferred diets to suit their lifestyle will provide a reflection of the effect of the intervention in real time, under non-experimental settings where participants are in control of the choices they make.

More so, since one of the key barriers identified for non-compliance to the diets, that emerged from the lived experiences of the participants was recurrent expression of lack of information on the calorific value of African staple food by participants in the CDD as well as non-inclusion of African staple foods in the dietetic booklet provided to participants in the HPLC group. To increase the chances of African women in having successful and positive experiences with weight loss intervention of this type in the future, it is strongly recommended that a similar dietetic booklet be devised and adapted to suit the needs of this population. The inclusion of major African staple foods and their dietary composition will serve a great deal for participants who would be assigned to the CDD diets, which will seem to be a default diet for this population, given their high intake of carbohydrate.

In future studies, it would be of interest to investigate if there are dissimilarities between dropouts and whether the differences span across the duration of the study or during a period. Further studies should also assess other parameters such as lipid profiles, as well as assess diet compliance by measuring urinary ketones in the HPLC dietary group.

A different approach from this design can be adopted for future intervention in this population, such as basing the intervention on behavioural theory. Since Social Cognitive Theory (SCT) and self-regulation theories both posit that new behaviours are formed through continual interplay between a person and the environment (Bandura, 2004; Wing et al, 2006) with techniques such as goal- setting, self-monitoring and problem-solving among other skills acquired in theory-based intervention (Michie and Abraham, 2004). It would be of interest to ascertain if this assertion is the case in this population.

Finally, health preventative measures must be taken to address this pertinent issue and empower this population with the right information to counter the looming obesity epidemic in the children of Africans in diaspora.

7.5 Strengths and Limitations of the Study

The first strength of this study lies on its novelty as the first study to assess the effectiveness and acceptability of HPLC and CDD among obese African women in NE Scotland, a population with habitually high intake of carbohydrate-based staple foods. Furthermore, the study design of mixed method allowed the combination of quantitative and qualitative evidence to obtain statistical and lived experiences of this population, gaining insight into the barriers and enablers relevant to adherence and acceptability of the diets tested. However, as this study was conducted exclusively with obese African women living in this region, the results of the study may have limited generalizability to other overweight or obese populations.

The small sample size and short duration of the intervention period posed a limitation to this study. However, the small sample size is justified as this was a feasibility study which should be used to inform a larger study. The number of participants recruited were deemed ample to form a quorum for two post-intervention focus groups after accounting for attrition, but this protocol was later changed to one-to-one telephone interviews for reasons stated in background and rationale for post-intervention interviews (see section 6.1).

Caution should be applied in the interpretation of the findings due to the insufficiency of statistical power with the small sample size. This limits the study's ability to ascertain any major differences in weight loss between the two approaches. Hence, it cannot be assumed that similar weight loss in both diets would or would not be obtained in a much larger sample.

The simple randomization adopted in assigning participants into their dietary group posed additional limitation on this study. This resulted to a slightly higher number of participants being assigned to the CDD (n=18) in comparison to the HPLC (N=15) group, however, this difference was accounted through drop-out and in the final analysis. A stratified randomization approach, however, may have been more suitable given the complexity of the feasibility study.

The remote follow-up of participants by emails and phone during the dietary intervention period was another limitation to this study. With hindsight, face-to-face meetings could have been more appropriate; however, this approach was informed by participants' preference identified through the focus group discussion. Besides the support participants would have received, the error in completing the food diaries could have been identified and corrected.

Another limitation of this study was the omission of weighing the participants at end of the 6 months follow up to know if they maintained their weight loss. But this would not have been possible because of the transient nature of this group which was the main reason for changing the protocol from post focus group to telephone semi-structured interview.

Finally, RCTs are widely recognised as the gold standard method for control trials, nonetheless, this method results to high attrition rates. Although not a typical RCT, randomly assigning participants to diets that is not suitable for their lifestyle, family or eating preferences, could influence the outcome of the study, for example, dropout rates.

7.6 Summary and Conclusions

This study highlights the urgent need for a culturally tailored dietary interventions that will enable African women lose weight and maintain healthy lifestyle. The study design adopted enabled the use of focus groups to identify the most

appropriate approach to recruit from and undertake the feasibility dietary intervention. Key food habits and eating behaviour of African women who participated within their social context were highlighted, coupled with the meaning they give to food, their food preferences and frequency of consumption of favourite foods, and family dynamics – who oversaw food preparation or food choices made for the family. The findings further indicate the challenges they faced with food availability and cost; factors shown not only to be prevalent among African women but also reported in other populations.

The outcomes of the study illustrate to some extent that the two diets are effective in inducing weight loss in obese African women and acceptability of both diets are comparable. However, the effectiveness and acceptability of these diets can be enhanced through provision of a more culturally tailored and relatable dietary tools to this population. These findings are important to inform health policy and dietary interventions offered to this group of women and one of the ways to achieve this goal is to make available dietetic booklet with information on calorific content of major African staple foods. The information on the dietetic booklet should be based on both HPLC and CDD diets to offer choices to participants, however, should focus primarily on calorie reduced diets with suggested portion control sizes. Since this population staple diet is based on carbohydrate, they are likely to return to carbohydrate-based foods as their default diet at the long run.

For future dietary intervention studies, it will be plausible to include a qualitative component by exploring barriers to given diets as a compulsory addition, as most of the time, this aspect is omitted in dietary intervention studies. The rich data derived from the post-intervention interview helped, not only to identify the struggles of participants on a practical level (e.g. the issues with the booklet etc) but more at a behavioural change level. Although this study did not set out to change behaviour or incorporate behavioural theories, it remains an area of possible interest in future studies in this population.

REFERENCES

Aberdeen City Council, 2011. Migration Workers in Aberdeen City and Shire. Briefing Paper 2011/04. Available at:

<http://www.aberdeencity.gov.uk/nmsruntime/saveasdialog.asp?!ID=32394&sID=3365>

Abraham, C., Norman, P. and Conner, M., 2013. Health Promotion from the Perspective of Social Cognitive Theory. In *Understanding and Changing Health Behaviour* (pp. 315-356). Psychology Press.

Abubakari, A.R. and Bhopal, R. 2008. Systematic review on the prevalence of diabetes, overweight/obesity and physical inactivity in Ghanaians and Nigerians. *Public Health*, 122:173-82

Abubakari, A.R. et al., 2008. Prevalence and time trends in obesity among adult West African populations: a meta-analysis. *Obesity Reviews*, 9(4), pp. 297-311

Acheampong, I. and Haldeman, L. 2013. Are Nutrition Knowledge, Attitudes, and Beliefs Associated with Obesity among Low-Income Hispanic and African American Women Caretakers? *Journal of Obesity*. Volume 2013, Article ID 123901, 8 pages. Available at: <http://dx.doi.org/10.1155/2013/123901>

Adeboye B, Bermano G, Rolland C. 2012. Obesity and its health impact in Africa: A systematic review. *Cardiovascular Journal of Africa*. 23(9): 512-52

African Union, Definition of the African Union, <http://www.au.int/en/>

Agyemang, C., Bhopal, R. and Bruijnzeels, M., 2005. Negro, Black, Black African, African Caribbean, African American or what? Labelling African origin populations in the health arena in the 21st century. *Journal of Epidemiology & Community Health*, 59(12), pp.1014-1018.

Agyemang, C., Addo, J. Bhopal, R., de Graft Aikins, A. and Stronks, K. 2009. Cardiovascular disease, diabetes and established risk factors among populations of sub-Saharan African descent in Europe: a literature review. *Globalization and*

Health; 5(1):7.

Agyemang, C., Boatemaa, S., Agyemang Frempong, G. and de-Graft Aikins, A., 2016. Obesity in sub-Saharan Africa. *Metabolic Syndrome: A Comprehensive Textbook*, pp.41- 53

Ahlgren, C., Hammarström, A., Sandberg, S., Lindahl, B., Olsson, T., Larsson, C. and Fjellman-Wiklund, A., 2016. Engagement in new dietary habits—obese women’s experiences from participating in a 2-year diet intervention. *International journal of behavioral medicine*, 23(1), pp.84-93.

AJAYI, J.F.A., 1989. *General history of Africa: Africa in the nineteenth century until the 1880s*. Bernan Assoc.

Ali M. 2013. Culture and Behaviour. *Behavioural Sciences*. Available at: <http://behaviouralsciences.net/culture-and-behaviour/>

Ali, A.T. and Crowther, N.J., 2010. Factors predisposing to obesity: a review of the literature. *South African Family Practice*, 52(3), pp.193-197. *Am J Clin Nutr* 2006; 84: 289. PMID: 16895874.

Alvesson, M. and Sköldberg, K., 2017. *Reflexive methodology: New vistas for qualitative research*. Sage. *Am J Clin Nutr* 2006; 84: 289. PMID: 16895874.

Amugsi, D.A., Dimbuene, Z.T., Mberu, B., Muthuri, S. and Ezeh, A.C., 2017. Prevalence and time trends in overweight and obesity among urban women: an analysis of demographic and health surveys data from 24 African countries, 1991–2014. *BMJ open*, 7(10), p.e017344.

Anderson, J.D., 2006. *Qualitative and quantitative research*. Imperial COE, 3. Available at: https://www.icoe.org/webfm_send/1936

Anderson, J., 2009. *Interventions on diet and physical activity: what works: summary report*. World Health Organization. Geneva.

Aneke-Nash, C.S., Parrinello, C.M., Rajpathak, S.N., Rohan, T.E., Strotmeyer, E.S., Kritchevsky, S.B., Psaty, B.M., Bůžková, P., Kizer, J.R., Newman, A.B. and Strickler, H.D., 2015. Changes in Insulin-Like Growth Factor-I and Its Binding Proteins Are Associated with Diabetes Mellitus in Older Adults. *Journal of the*

American Geriatrics Society, 63(5), pp.902-909.

Arbeitskreis Deutscher Markt (ADM) 2012. Quantitative Interviews der Mitgliedsinstitute des ADM nach Befragungsart, Available at: (<http://www.adm-ev.de/index.php?id=zahlen#c245>)

Archer, L., Maylor, U., Osgood, J. and Read, B., 2014. Final report: An exploration of the attitudinal, social and cultural factors impacting year 10 students performance. Institute for Policy Studies in Education. Retrieved, 5.

Armstrong, T.D., Crum, L.D., Rieger, R.H., Bennett, T.A. and Edwards, L.J., 1999. Attitudes of African Americans toward participation in medical research. *Journal of Applied Social Psychology*, 29(3), pp.552-574

Artinian, N.T., 2007. Telehealth as a tool for enhancing care for patients with cardiovascular disease. *Journal of Cardiovascular Nursing*, 22(1), pp.25-31.

Artinian, N.T., Fletcher, G.F., Mozaffarian, D., Kris-Etherton, P., Van Horn, L., Lichtenstein, A.H., Kumanyika, S., Kraus, W.E., Fleg, J.L., Redeker, N.S. and Meininger, J.C., 2010. Interventions to promote physical activity and dietary lifestyle changes for cardiovascular risk factor reduction in adults: a scientific statement from the American Heart Association. *Circulation*, 122(4), pp.406-441.

Artmann, S. 2013. Culture and Behaviour. Science. Available at: <http://www.leopoldina.org/en/science/culture-and-behaviour/>

Asfaw, A., 2006. The effects of obesity on doctor-diagnosed chronic diseases in Africa: empirical results from Senegal and South Africa. *Journal of public health policy*, 27(3), pp.250-264.

Assah, F.K., Ekelund, U., Brage, S., Mbanya, J.C. and Wareham, N.J., 2011. Urbanization, physical activity, and metabolic health in sub-Saharan Africa. *Diabetes Care*, 34(2), pp.491-496.

Assogba, Y., 2002. Diaspora, mondialisation et développement de l'Afrique. *Nouvelles pratiques sociales*, 15(1), pp.98-110

Astrup, A., 2001. The role of dietary fat in the prevention and treatment of obesity. Efficacy and safety of low-fat diets. *International Journal of Obesity*, 25(S1),

p.S46.

Astrup, A., Grunwald, G.K., Melanson, E.L., Saris, W.H.M. and Hill, J.O., 2000. The role of low-fat diets in body weight control: a meta-analysis of ad libitum dietary intervention studies. *International journal of obesity*, 24(12), p.1545.

Ayala, G.X. and Elder, J.P., 2011. Qualitative methods to ensure acceptability of behavioral and social interventions to the target population. *Journal of Public Health Dentistry*, 71, pp.S69-S79.

Bah, O., 2011. "[Ghanaian cuisine, dokonu, banku, okra and soup](#)".
kadirecipes.com

Bakhach, M., Shah, V., Harwood, T., Lappe, S., Bhesania, N., Mansoor, S. and Alkhouri, N., 2016. The protein-sparing modified fast diet: an effective and safe approach to induce rapid weight loss in severely obese adolescents. *Global pediatric health*, 3, p.2333794X15623245.

Balan, N. B., 2005. Multiple voices and methods: Listening to women who are in workplace transition. *International Journal of Qualitative Methods*, 4, 1–21

Balley, S., Bucher, B., Petrelli, D., Ruas, A., van Kreveld, M., Sanderson, M. and Sester, M., 2004. User requirements specification reassessment. Retrieved on June, 12, p.2012.

Bandura A. 1997. *The Social Foundation of Thought & Action: A Social Cognitive Theory*. Prentice Hall, Englewood Cliffs, NJ.

Bandura, A., 1986. *Social foundations of thought and action*. Englewood Cliffs, NJ, 1986.

Bandura, A., 1998. Health promotion from the perspective of social cognitive theory. *Psychology and health*, 13(4), pp.623-649.

Bandura, A., 2002. Social cognitive theory in cultural context. *Applied psychology*, 51(2), pp.269-290.

Barnes, A.S., Goodrick, G.K., Pavlik, V., Markesino, J., Laws, D.Y. and Taylor, W.C., 2007. Weight loss maintenance in African American women: Focus group results and questionnaire development. *Journal of general internal medicine*,

22(7), pp.915-922.

Baruth, M., Sharpe, P.A., Parra-Medina, D. and Wilcox, S., 2014. Perceived barriers to exercise and healthy eating among women from disadvantaged neighbourhoods: results from a focus groups assessment. *Women & health*, 54(4), pp.336-353.S

Befort, C.A., Nollen, N., Ellerbeck, E.F., Sullivan, D.K., Thomas, J.L. and Ahluwalia, J.S., 2008. Motivational interviewing fails to improve outcomes of a behavioral weight loss program for obese African American women: a pilot randomized trial. *Journal of behavioral medicine*, 31(5), p.367 - 377.

Ben-Ari, A. and Enosh, G., 2011. Processes of reflectivity: Knowledge construction in qualitative research. *Qualitative Social Work*, 10(2), pp.152-171.

Berger, R., 2015. Now I see it, now I don't: Researcher's position and reflexivity in qualitative research. *Qualitative research*, 15(2), pp.219-234

Benight, C.C. and Bandura, A., 2004. Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour research and therapy*, 42(10), pp.1129- 1148.

Benkeser, R.M., Biritwum, R. and Hill, A.G., 2012. Prevalence of overweight and obesity and perception of healthy and desirable body size in urban, Ghanaian women. *Ghana medical journal*, 46(2), pp.66-75.

Bennett, G.G. and Wolin, K.Y., 2006. Satisfied or unaware? Racial differences in perceived weight status. *International Journal of Behavioural Nutrition and Physical Activity*, 3(1), pp. 40

Bennett, G.G., Foley, P., Levine, E., Whiteley, J., Askew, S., Steinberg, D.M., Batch, B., Greaney, M.L., Miranda, H., Wroth, T.H. and Holder, M.G., 2013. Behavioral treatment for weight gain prevention among black women in primary care practice: a randomized clinical trial. *JAMA internal medicine*, 173(19),

pp.1770-1777.

Bernard, H.R. 2002. *Research Methods in Anthropology: Qualitative and quantitative methods*. 3rd edition. AltaMira Press, Walnut Creek, California

Beyea, S.C. and Nicoll, L.H., 2000. Methods to conduct focus groups and the moderator's role. *AORN journal*, 71(5), pp.1067-1068.

Bhopal, R., 2006. Race and ethnicity: responsible use from epidemiological and public health perspectives. *The Journal of Law, Medicine & Ethics*, 34(3), pp. 500-507

Bhopal, R.S., 2012. The quest for culturally sensitive health-care systems in Scotland: insights for a multi-ethnic Europe. *Journal of Public Health*, 34(1), pp. 5-11

Bhurosy, T. and Jeewon, R., 2014. Overweight and obesity epidemic in developing countries: a problem with diet, physical activity, or socioeconomic status?. *The Scientific World Journal*, 2014.

Biadgilign, S., Mgutshini, T., Haile, D., Gebremichael, B., Moges, Y. and Tilahun, K., 2017. Epidemiology of obesity and overweight in sub-Saharan Africa: a protocol for a systematic review and meta-analysis. *BMJ open*, 7(11), p.e017666.

Birt, L., Scott, S., Cavers, D., Campbell, C. and Walter, F., 2016. Member checking: a tool to enhance trustworthiness or merely a nod to validation? *Qualitative health research*, 26(13), pp.1802-1811.

Blythe, S., Wilkes, L., Jackson, D. and Halcomb, E., 2013. The challenges of being an insider in storytelling research. *Nurse researcher*, 21(1).

Bourne, L.T., Lambert, E.V. and Steyn, K., 2002. Where does the black population of South Africa stand on the nutrition transition? *Public health nutrition*, 5(1a), pp.157-162.

Brand-Miller, J.C., 2003. Glycemic load and chronic disease. *Nutrition reviews*, 61(suppl_5), pp.S49-S55.

Brannen, J., 2005. Mixed methods research: A discussion paper.

Brannick, T. and Coghlan, D., 2007. In defense of being "native": The case for

- insider academic research. *Organizational research methods*, 10(1), pp.59-74.
- Brehm, B.J., Seeley, R.J., Daniels, S.R. and D'alessio, D.A., 2003. A randomized trial comparing a very low carbohydrate diet and a calorie-restricted low-fat diet on body weight and cardiovascular risk factors in healthy women. *The Journal of Clinical Endocrinology & Metabolism*, 88(4), pp.1617-1623.
- Breitkopf, C. R., Littleton, H. and Berenson, A. 2007. Body image: A study in a tri-ethnic sample of low-income women. *Sex Roles*, 56, 373-380
- Brink, P.J., 1995. Fertility and fat: the Annang fattening. *Soc Aspects Obes*, 1, p.71.
- Brinkworth, G.D., Noakes, M., Keogh, J.B., Luscombe, N.D., Wittert, G.A. and Clifton, P.M., 2004. Long-term effects of a high-protein, low-carbohydrate diet on weight control and cardiovascular risk markers in obese hyperinsulinemic subjects. *International Journal of Obesity*, 28(5), p.661.
- Brown, L.M. and Gilligan, C., 1993. Meeting at the crossroads: Women's psychology and girls' development. *Feminism & Psychology*, 3(1), pp.11-35.
- Brown, P.J., 1991. Culture and the evolution of obesity. *Human nature*, 2(1), pp.31-57.
- Brown, N.A., Smith, K.C. and Kromm, E.E., 2012. Women's perceptions of the relationship between recent life events, transitions, and diet in midlife: findings from a Focus Group Study. *Women & health*, 52(3), pp.234-251.
- Bryman, A., 2003. *Quantity and quality in social research*. Routledge.
- Burke, N.J., Joseph, G., Pasick, R.J. and Barker, J.C., 2009. Theorizing social context: Rethinking behavioral theory. *Health Education & Behavior*, 36(5_suppl), pp.55S-70S.
- Buttriss, J.L., 2016. The Eatwell guide refreshed. *Nutrition Bulletin*, 41(2), pp.135-141.
- Caballero, B., 2007. The global epidemic of obesity: an overview. *Epidemiologic reviews*, 29(1), pp. 1-5
- Calogero, R.M., Boroughs, M. and Thompson, J.K., 2007. The impact of Western

beauty ideals on the lives of women: A sociocultural perspective. In *The body beautiful* (pp. 259-298). Palgrave Macmillan, London.

Campbell, M.K, Hudson, M.A, Resnicow, K., Blakeney, N., Paxton, A and Baskin, M., 2007. Church-Based Health Promotion Interventions: Evidence and Lessons Learned. *Annual Review of Public Health*. Vol. 28: 213-23.

Cappuccio, F.P., Kerry, S.M., Adeyemo, A., Luke, A., Amoah, A.G., Bovet, P., Connor, M.D., Forrester, T., Gervasoni, J.P., Kaki, G.K. and Plange-Rhule, J., 2008. Body size and blood pressure: an analysis of Africans and the African diaspora. *Epidemiology (Cambridge, Mass.)*, 19(1), p.38.

Casey, D. and Murphy, K., 2009. Issues in using methodological triangulation in research. *Nurse researcher*, 16(4).

Chatters, L.M., Taylor, R.J., Bullard, K.M. and Jackson, J.S., 2009. Race and ethnic differences in religious involvement: African Americans, Caribbean blacks and non-Hispanic whites. *Ethnic and racial studies*, 32(7), pp.1143-1163.

Chandler-Laney, P.C., Phadke, R.P., Granger, W.M., Fernández, J.R., Muñoz, J.A., Man, C.D., Cobelli, C., Ovalle, F. and Gower, B.A., 2011. Age-Related Changes in Insulin Sensitivity and β -Cell Function Among European-American and African-American Women. *Obesity*, 19(3), pp.528-535.

Charmaz, K., 2006. *Constructing grounded theory: A practical guide through qualitative analysis*. sage.

Cho, J. and Trent, A., 2006. Validity in qualitative research revisited. *Qualitative research*, 6(3), pp.319-340.

Choices, N.H.S., 2013. Healthy eating. Online information available at <http://www.nhs.uk/livewell/healthy-eating/Pages/Healthyeating.aspx> (accessed June 2015).

Clancy, M., 2013. Is reflexivity the key to minimising problems of interpretation in phenomenological research? *Nurse researcher*, 20(6).

Kitchen, C.M., 2013. Methods in focus group interviews in cross-cultural settings. *Qualitative Research Journal*, 13(3), pp.265-277.

Clark, M.J., Cary, S., Diemert, G., Ceballos, R., Sifuentes, M., Atteberry, I., Vue,

F. and Trieu, S., 2003. Involving communities in community assessment. *Public Health Nursing*, 20(6), pp.456-463.

Coffee, N.T., Howard, N., Paquet, C., Hugo, G. and Daniel, M., 2013. Is walkability associated with a lower cardiometabolic risk?. *Health & place*, 21, pp.163-169.

Cotter, A.P., Durant, N., Agne, A.A. and Cherrington, A.L., 2014. Internet interventions to support lifestyle modification for diabetes management: a systematic review of the evidence. *Journal of Diabetes and its Complications*, 28(2), pp.243-251.

Couture, A.L., Zaidi, A.U. and Maticka-Tyndale, E., 2012. Reflexive accounts: An intersectional approach to exploring the fluidity of insider/outsider status and the researcher's impact on culturally sensitive post-positivist qualitative research. *Qualitative Sociology Review*, 8(1).

Craig, R. and Mindell, J. eds., 2012. *Health survey for England 2011*. NHS Information Centre.

Cresswell, J.W., 1998. *Qualitative inquiry and research design: Choosing among five traditions*.

Creswell, J.W. and Clark, V.L.P., 2017. *Designing and conducting mixed methods research*. Sage publications.

Creswell, J.W., 2014. *Research design: qualitative, quantitative, and mixed methods approach*. Thousand Oaks, CA: SAGE.

Creswell, J.W., 2013. *Steps in conducting a scholarly mixed methods study*.

Crotty, M., 1998. *The foundations of social research: Meaning and perspective in the research process*. Sage.

Cruz, C., 2003. *Mixing theories: Interpreting and using a relational, voice-centred methodology*. Retrieved from <http://www.eric.ed.gov/PDFS/ED478481.pdf>

Cunliffe, A.L. and Locke, K., 2016. Subjectivity, difference and method. *Qualitative Research in Organizations and Management: An International Journal*, 11(2).

Dalton, 2004. *Genetics contributes to excess energy – under factors associated*

with obesity in African diaspora

Dansinger, M.L., Gleason, J.A., Griffith, J.L., Selker, H.P. and Schaefer, E.J., 2005. Comparison of the Atkins, Ornish, Weight Watchers, and Zone diets for weight loss and heart disease risk reduction: a randomized trial. *Jama*, 293(1), pp.43-53.

Davidson, M. and Knafl, K.A., 2006. Dimensional analysis of the concept of obesity. *Journal of Advanced Nursing*, 54(3), pp.342-350.

Davis S. 2012. Long-term follow-up of an 8-week weight loss intervention: Impact of psychosocial factors. Graduate Theses and Dissertations. Paper 1271. Available at: <http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=3719&context=etd>

Dawson-Hughes, B., Harris, S.S., Rasmussen, H., Song, L. and Dallal, G.E., 2004. Effect of dietary protein supplements on calcium excretion in healthy older men and women.

The Journal of Clinical Endocrinology & Metabolism, 89(3), pp.1169-1173.

De Cruz, L.M., 2016. Women's Perceptions of Their Experience of Miscarriage Decades After the Event: An Interpretative Phenomenological Analysis (Doctoral dissertation, Keele University Available at: <https://core.ac.uk/download/pdf/80788974.pdf>

Delisle, H., 2010. Findings on dietary patterns in different groups of African origin undergoing nutrition transition. *Applied Physiology, Nutrition, and Metabolism*, 35(2), pp.224-228.

Denke, M.A., 2001. Metabolic effects of high-protein, low-carbohydrate diets. *American Journal of Cardiology*, 88(1), pp.59-61.

Devlin, H., Roberts, M., Okaya, A. and Xiong, Y.M., 2006. Our lives were healthier before: focus groups with African American, American Indian, Hispanic/Latino, and Hmong people with diabetes. *Health promotion practice*, 7(1), pp.47-55.

Diaz, V.A., Mainous, A.G., Baker, R., Carnemolla, M. and Majeed, A., 2007. How does ethnicity affect the association between obesity and diabetes?. *Diabetic medicine*, 24(11), pp.1199-1204.

Dickey, R.A., Bartuska, D., Bray, G.W., Callaway, C.W., Davidson, E.T., Feld, S.,

- Ferraro, R.T., Hodgson, S.F., Jellinger, P.S., Kennedy, F.P. and Lawrence, A.M., 1998. AACE/ACE Position statement on the prevention, diagnosis, and treatment of obesity (1998 revision). *Endocr Pract*, 4(5), pp.297-350.
- Doerksen, S. and McAuley, E., 2014. Social cognitive determinants of dietary behavior change in university employees. *Frontiers in public health*, 2, p.23.
- Dombrowski, S.U., Avenell, A. and Sniehott, F.F., 2010. Behavioural interventions for obese adults with additional risk factors for morbidity: systematic review of effects on behaviour, weight and disease risk factors. *Obesity Facts*, 3(6), pp.377-396.
- Doucet, A., Mauthner, N. S., 2008. What can be known and how? Narrated subjects and the listening guide. *Qualitative Research*, 8, 399–409.
- Draper, A.K., 2004. The principles and application of qualitative research. *Proceedings of the nutrition society*, 63(4), pp.641-646.
- Drew, N., 2004. Creating a synthesis of intentionality: The role of the bracketing facilitator. *Advances in Nursing Science*, 27(3), pp.215-223.
- Duda, R.B., Jumah, N.A., Hill, A.G., Seffah, J. and Biritwum, R., 2007. Assessment of the ideal body image of women in Accra, Ghana. *Tropical doctor*, 37(4), pp.241-244.
- Dugas, L.R., Carstens, M.A., Ebersole, K., Schoeller, D.A., Durazo-Arvizu, R.A., Dwyer, S.C. and Buckle, J.L., 2009. The space between: On being an insider-outsider in qualitative research. *International journal of qualitative methods*, 8(1), pp.54-63.
- Dyson, P.A., Beatty, S. and Matthews, D.R., 2007. A low-carbohydrate diet is more effective in reducing body weight than healthy eating in both diabetic and non-diabetic subjects. *Diabetic Medicine*, 24(12), pp.1430-1435.
- Elobeid, M.A., Padilla, M.A., McVie, T., Thomas, O., Brock, D.W., Musser, B., Lu, K., Coffey, C.S., Desmond, R.A., St-Onge, M.P. and Gadde, K.M., 2009. Missing data in randomized clinical trials for weight loss: scope of the problem, state of

the field, and performance of statistical methods. *PloS one*, 4(8), p.e6624.

Faber, M. and Kruger, H.S., 2005. Dietary intake, perceptions regarding body weight, and attitudes toward weight control of normal weight, overweight, and obese black females in a rural village in South Africa. *Ethn Dis*, 15(2), pp.238-245.

Fade, S., 2004. Using interpretative phenomenological analysis for public health nutrition and dietetic research: a practical guide. *Proceedings of the nutrition society*, 63(4), pp.647-653.

Fairclough, N., 2013. *Critical discourse analysis: The critical study of language*. Routledge.

Fezeu, L., Balkau, B., Kengne, A.P., Sobngwi, E. and Mbanya, J.C., 2007. Metabolic syndrome in a sub-Saharan African setting: central obesity may be the key determinant. *Atherosclerosis*, 193(1), pp.70-76.

Fezeu, L., Minkoulou, E., Balkau, B., Kengne, A.P., Awah, P., Unwin, N., Alberti, G.K. and Mbanya, J.C., 2005. Association between socioeconomic status and adiposity in urban Cameroon. *International journal of epidemiology*, 35(1), pp.105-111.

Finlay, L., 2002. "Outing" the researcher: The provenance, process, and practice of reflexivity. *Qualitative health research*, 12(4), pp.531-545.

Finucane, M.M., Stevens, G.A., Cowan, M.J., Danaei, G., Lin, J.K., Paciorek, C.J., Singh, G.M., Gutierrez, H.R., Lu, Y., Bahalim, A.N. and Farzadfar, F., 2011. National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9· 1 million participants. *The Lancet*, 377(9765), pp.557-567.

Fitzgibbon, M.L., Stolley, M.R., Ganschow, P., Schiffer, L., Wells, A., Simon, N. and Dyer, A., 2005. Results of a faith-based weight loss intervention for black women. *Journal of the National Medical Association*, 97(10), p.1393.

Fitzgibbon, M.L., Stolley, M.R., Schiffer, L., Sanchez-Johnsen, L.A., Wells, A.M. and Dyer, A., 2005. A combined breast health/weight loss intervention for Black women. *Preventive medicine*, 40(4), pp.373-383.

Fitzgibbon ML, Tussing-Humphreys LM, Porter JS, Martin IK, Odoms-Young A,

Sharp LK. 2012. Weight loss and African American women: a systematic review of the behavioral weight loss intervention literature. *Obes Rev*; 13(3):193-213.

Flegal KM, Carroll MD, Ogden CL, Curtin LR. 2010. Prevalence and trends in obesity among US adults, 1999–2008. *JAMA*;303(3):235–241.

Fock, K.M. and Khoo, J., 2013. Diet and exercise in management of obesity and overweight. *Journal of gastroenterology and hepatology*, 28, pp.59-63.

Fogelholm, G.M., Sieva, H.T., Kukkonen-Harjula, T.K. and Pasanen, M.E., 2001. Bone mineral density during reduction, maintenance and regain of body weight in premenopausal, obese women. *Osteoporosis International*, 12(3), pp.199-206.

Foley, D.E., 2002. Critical ethnography: The reflexive turn. *International Journal of Qualitative Studies in Education*, 15(4), pp.469-490.

Foresight., 2008. *Tackling Obesities: Future Choices 2nd Edition – Modelling Future Trends in Obesity & Their Impact on Health*. Government Office for Science. Available at: www.foresight.gov.uk/Obesity/14.pdf

Foster, G.D., Wadden, T.A., Makris, A.P., Davidson, D., Sanderson, R.S., Allison, D.B. and Kessler, A., 2003. Primary care physicians' attitudes about obesity and its treatment. *Obesity research*, 11(10), pp.1168-1177.

Freedman, M.R., King, J. and Kennedy, E., 2001. Popular diets: a scientific review.

Frey, M and Fogoros, RN. 2019. How to measure waist circumference for health. *Verywellfit*. Available at: <https://www.verywellfit.com/what-is-waist-circumference-3495558>

Fyfe, C.L., Stewart, J., Murison, S.D., Jackson, D.M., Rance, K., Speakman, J.R., Horgan, G.W. and Johnstone, A.M., 2010. Evaluating energy intake measurement in free-living subjects: when to record and for how long?. *Public health nutrition*, 13(2), pp.172-180.

Gadbury, G.L., Coffey, C.S. and Allison, D.B., 2003. Modern statistical methods for handling missing repeated measurements in obesity trial data: beyond LOCF. *Obesity Reviews*, 4(3), pp.175-184.

Gardner, C.D., Kiazand, A., Alhassan, S., Kim, S., Stafford, R.S., Balise, R.R.,

Kraemer, H.C. and King, A.C., 2007. Comparison of the Atkins, Zone, Ornish, and LEARN diets for change in weight and related risk factors among overweight premenopausal women: the A TO Z Weight Loss Study: a randomized trial. *Jama*, 297(9), pp.969-977.

Garfinkel, H., 1996. Ethnomethodology's program. *Social psychology quarterly*, 59(1), pp.5-21.

Gearing, R.E., 2004. Bracketing in research: A typology. *Qualitative health research*, 14(10), pp.1429-1452.

Gerrish, K., Chau, R., Sobowale, A. & Birks, E. 2004. Bridging the language barrier: The use of interpreters in primary nursing care, *Health and Social care in the Community*, 12 (5), pp. 407-413.

Gibbs H.D., Broom, J., McGee, M.A., MacLennan, G.S., 2002 Weight outcomes in specialist obesity clinic using healthy eating and/or protein sparing modified fast in an outpatient setting. *Int J Obes*. 2002;26: S45

Gideon, L., 2012. *Handbook of survey methodology for the social sciences*. New York: Springer.

Gilbert, P.A. and Khokhar, S. 2008. Changing dietary habits of ethnic groups in Europe and implications for health. *Nutr. Rev.* 66(4): 203-215

Gilligan, C., Spencer, R., Weinberg, M. K., Bertsch, T., 2003. On the listening guide: A voice-centred relational method. In Camic, P. M., Rhodes, J. E., Yardley, L. (Eds.), *Qualitative research in psychology: Expanding perspectives in methodology and design* (pp. 157–172). Washington, DC: American Psychological Association.

Gilliss, C.L., Lee, K.A., Gutierrez, Y., Taylor, D., Beyene, Y., Neuhaus, J. and Murrell, N., 2001. Recruitment and retention of healthy minority women into community-based longitudinal research. *Journal of women's health & gender-based medicine*, 10(1), pp.77- 85.

Glanz, K., Rimer, B.K. and Viswanath, K. eds., 2008. *Health behavior and health education: theory, research, and practice*. John Wiley & Sons.

Goedecke, J.H., Levitt, N.S., Lambert, E.V., Utzschneider, K.M., Faulenbach, M.V.,

- Dave, J.A., West, S., Victor, H., Evans, J., Olsson, T. and Walker, B.R., 2009. Differential effects of abdominal adipose tissue distribution on insulin sensitivity in black and white South African women. *Obesity*, 17(8), pp.1506-1512.
- Gordon, K.H., Castro, Y., Sitnikov, L. and Holm-Denoma, J.M., 2010. Cultural body shape ideals and eating disorder symptoms among White, Latina, and Black college women. *Cultural Diversity and Ethnic Minority Psychology*, 16(2), p.135.
- Grabe, S. and Hyde, J. S. (2006). Ethnicity and body dissatisfaction among women in the United States: A meta-analysis. *Psychological Bulletin*, 132, 622-640.
- Grabe, S., Ward, L.M. and Hyde, J.S., 2008. The role of the media in body image concerns among women: a meta-analysis of experimental and correlational studies. *Psychological bulletin*, 134(3), p.460.
- Greene, J. C., 2008. Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, 2(1), 7-22
- Greene, J.C. and Caracelli, V.J., 2003. Making paradigmatic sense of mixed methods practice. *Handbook of mixed methods in social and behavioral research*, 9, pp.91-110.
- Gryka, A., 2011. Alterations in the macronutrient content of the diet and the effects on body composition, cardiovascular disease risk and the control of energy metabolism in obese patients with type 2 diabetes mellitus.
- Guba, E.G. and Lincoln, Y.S., 2005. Paradigmatic controversies, contradictions, and emerging confluences.
- Halcomb, E.J. and Andrew, S., 2005. Triangulation as a method for contemporary nursing research. *Nurse researcher*, 13(2).
- Hayman, B., Wilkes, L., Jackson, D. and Halcomb, E., 2012. Story-sharing as a method of data collection in qualitative research. *Journal of Clinical Nursing*, 21(1-2), pp.285-287.
- Halcomb, E.J. et al., 2007. Literature review: considerations in undertaking focus group research with culturally and linguistically diverse groups. *Journal of Clinical*

Nursing, 16(6), pp. 1000-1011

Halyburton, A.K., Brinkworth, G.D., Wilson, C.J., Noakes, M., Buckley, J.D., Keogh, J.B. and Clifton, P.M., 2007. Low-and high-carbohydrate weight-loss diets have similar effects on mood but not cognitive performance. *The American journal of clinical nutrition*, 86(3), pp.580-587.

Hammarström, A., Wiklund, A.F., Lindahl, B., Larsson, C. and Ahlgren, C., 2014. Experiences of barriers and facilitators to weight-loss in a diet intervention-a qualitative study of women in Northern Sweden. *BMC women's health*, 14(1), p.59.

Hammersley, M. and Atkinson, P., 2007. *Ethnography: Principles in practice*. Routledge.

Hardy, O.T., Czech, M.P. and Corvera, S., 2012. What causes the insulin resistance underlying obesity? *Current opinion in endocrinology, diabetes, and obesity*, 19(2), p.81.

Harvey, C., Schofield, G. and Williden, M., 2018. The lived experience of healthy adults following a ketogenic diet: A qualitative study. *The Journal of Holistic Performance*, p.3638.

Heaney, R.P., 1993. Nutritional factors in osteoporosis. *Annual Review of Nutrition*, 13(1), pp. 287-316

Hebden, L., Cook, A., Van Der Ploeg, H.P., King, L., Bauman, A. and Allman-Farinelli, M., 2014. A mobile health intervention for weight management among young adults: a pilot randomised controlled trial. *Journal of Human Nutrition and Dietetics*, 27(4), pp.322-332.

Hegsted, D.M., 2001. Fractures, calcium, and the modern diet. *The American journal of clinical nutrition*, 74(5), pp.571-573.

Hesse-Biber, S.N. and Leavy, P. eds., 2010. *Handbook of emergent methods*. Guilford Press.

Hellawell, D., 2006. Inside-out: analysis of the insider-outsider concept as a heuristic device to develop reflexivity in students doing qualitative research.

Teaching in higher education, 11(4), pp.483-494.

Hession, M., Rolland, C., Kulkarni, U., Wise, A. and Broom, J., 2009. Systematic review of randomized controlled trials of low-carbohydrate vs. low-fat/low-calorie diets in the management of obesity and its comorbidities. *Obesity reviews*, 10(1), pp.36-50.

Hill AM, Kris-Etherton PM., 2008. Contemporary strategies for weight loss and cardiovascular disease risk factor modification. *Curr Atheroscler Rep*. 10(6):486–496.

Hillsberg A. Obesity and the Black American: causes, culture, consequences, and cost. Available from: <http://financesonline.com/obesity-and-the-black-american-causes-culture-consequences-andcost/>

Holdsworth, M., Gartner, A., Landais, E., Maire, B. and Delpuech, F., 2004. Perceptions of healthy and desirable body size in urban Senegalese women. *International journal of obesity*, 28(12), p.1561.

Hollander, J.A., 2004. The social contexts of focus groups. *Journal of contemporary ethnography*, 33(5), pp.602-637.

Hollis, J.F., Gullion, C.M., Stevens, V.J., Brantley, P.J., Appel, L.J., Ard, J.D., Champagne, C.M., Dalcin, A., Erlinger, T.P., Funk, K. and Laferriere, D., 2008. Weight loss during the intensive intervention phase of the weight-loss maintenance trial. *American journal of preventive medicine*, 35(2), pp.118-126.

Holloway, I. and Galvin, K., 2016. *Qualitative research in nursing and healthcare*. John Wiley & Sons.

Holmboe-Ottesen, G. and Wandel, M., 2012. Changes in dietary habits after migration and consequences for health: a focus on South Asians in Europe. *Food & nutrition research*, 56(1), p.18891.

Hong, K., Li, Z., Wang, H.J., Elashoff, R. and Heber, D., 2005. Analysis of weight loss outcomes using VLCD in black and white overweight and obese women with and without metabolic syndrome. *International journal of obesity*, 29(4), p.436.

Hopkins, P., 2007. *Global events, national politics, local lives: young Muslim men*

in Scotland. *Environment and Planning A*, 39(5), pp.1119-1133.

Howe, K.R., 1988. Against the qualitative-quantitative incompatibility thesis or dogmas die hard. *Educational Researcher*, 17(8), pp. 10-16.

Hsiung, P.C., 2010. Reflexivity: Conceptual Baggage. *Lives and Legacies: A Guide to Qualitative Interviewing*.

Hu, T., Yao, L., Reynolds, K., Niu, T., Li, S., Whelton, P., He, J. and Bazzano, L., 2016. The effects of a low-carbohydrate diet on appetite: A randomized controlled trial. *Nutrition, Metabolism and Cardiovascular Diseases*, 26(6), pp.476-488.

Huang, H.H. and Coker, A.D., 2010. Examining issues affecting African American participation in research studies. *Journal of Black Studies*, 40(4), pp.619-636.

HUER, M.B. and SAENZ, T.I., 2003. Challenges and strategies for conducting survey and focus group research with culturally diverse groups. *American Journal of Speech-Language Pathology*, 12(2), pp. 209

Hunsberger, M., Tognon, G. and Lissner, L., 2014. Low-fat diets in obesity management and weight control. *Managing and Preventing Obesity: Behavioural Factors and Dietary Interventions*, p.91.

Ivankova, N.V., Creswell, J.W. and Stick, S.L., 2006. Using mixed-methods sequential explanatory design: From theory to practice. *Field methods*, 18(1), pp.3-20.

Jackson, M., Walker, S., Cruickshank, J.K., Sharma, S., Cade, J., Mbanya, J.C., Younger, N., Forrester, T.F. and Wilks, R., 2007. Diet and overweight and obesity in populations of African origin: Cameroon, Jamaica and the UK. *Public health nutrition*, 10(2), pp.122- 130.

Jaffiol, C., 2011. The burden of diabetes in Africa: a major public health problem. *Bulletin de l'Academie nationale de medecine*, 195(6), pp.1239-53.

Janz, N.K. and Becker, M.H., 1984. The health belief model: A decade later. *Health education quarterly*, 11(1), pp.1-47.

Jarvis, M.C., A.M. Miller, J. Sheahan, K. Ploetz, J. Ploetz, R.R. Watson, M.P. Ruiz, C.A.P. Villapan, J.G. Alvarado, A.L. Ramirez & B. Orr. 2004. Edible wild mushrooms

of the Cfre de Perote Region, Veracruz, Mexico: an ethnomycological study of common names and uses. *Economic Botany* 58:S111-S115

Jayaweera, H. and McNeil, R., Health of Migrants in the UK: What Do We Know? 2011. The Migration Observatory. Available at:

<http://www.migrationobservatory.ox.ac.uk/resources/briefings/health-of-migrants-in-the-uk-what-do-we-know/>

Jeffery, R.W., Kelly, K.M., Rothman, A.J., Sherwood, N.E. and Boutelle, K.N., 2004. The weight loss experience: a descriptive analysis. *Annals of Behavioral Medicine*, 27(2), pp.100-106.

Jensen, M.P., Turner, J.A. and Romano, J.M., 1994. What is the maximum number of levels needed in pain intensity measurement? *Pain*, 58(3), pp. 387-392

Johnson, C.C., Taylor, A.G., Anderson, J.G., Jones, R.A. and Whaley, D.E., 2014. Feasibility and acceptability of an Internet-based, African dance-modified yoga program for African-American women with or at risk for metabolic syndrome. *Journal of yoga & physical therapy*, 4.

Johnson, K., Posner, S.F., Biermann, J., Cordero, J.F., Atrash, H.K., Parker, C.S., Boulet, S. and Curtis, M.G., 2006. Recommendations to Improve Preconception Health and Health Care—United States: Report of the CDC/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care. *Morbidity and Mortality Weekly Report: Recommendations and Reports*, 55(6), pp.1-CE.

Johnson, R.B. and Onwuegbuzie, A.J., 2004. Mixed methods research: A research paradigm whose time has come. *Educational researcher*, 33(7), pp.14-26.

Johnson, R. B., Onwuegbuzie, A. J. & Turner, L. A. 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133.

Johnstone, A.M., Horgan, G.W., Murison, S.D., Bremner, D.M. and Lobley, G.E., 2008. Effects of a high-protein ketogenic diet on hunger, appetite, and weight loss in obese men feeding ad libitum. *The American journal of clinical nutrition*, 87(1), pp.44-55.

Jootun, D., McGhee, G. and Marland, G.R., 2009. Reflexivity: promoting rigour in qualitative research. *Nursing Standard* (through 2013), 23(23), p.42.

Joplin, L., 1981. On defining experiential education. *Journal of experiential education*, 4(1), pp.17-20.

Jordan, J., Lynch, U., Moutray, M., O'Hagan, M.T., Orr, J., Peake, S. and Power, J., 2007. Using focus groups to research sensitive issues: insights from group interviews on nursing in the Northern Ireland "Troubles". *International Journal of Qualitative Methods*, 6(4), pp.1-19. Jossey-Bass; San Francisco, CA: 2002. p. 45-66.

Jun, M., Peterson, R.T. and Zsidisin, G.A., 1998. The identification and measurement of quality dimensions in health care: focus group interview results. *Health care management review*, 23(4), pp.81-96.

Kaiser, K.A., Affuso, O., Beasley, T.M. and Allison, D.B., 2012. Getting carried away: a note showing baseline observation carried forward (BOCF) results can be calculated from published complete-cases results. *International Journal of Obesity*, 36(6), p.886.

Kengne, A.P., Amoah, A.G. and Mbanya, J.C., 2005. Cardiovascular complications of diabetes mellitus in sub-Saharan Africa. *Circulation*, 112(23), pp.3592-3601.

Kennedy, B.M., Champagne, C.M., Ryan, D.H., Newton, J.R., Conish, B.K., Harsha, D.W., Levy, E.J. and Bogle, M.L., 2009. The "Rolling Store": an economical and environmental approach to the prevention of weight gain in African American women. *Ethnicity & disease*, 19(1), pp.7-12

Kennedy, B.M., Kumanyika, S., Ard, J.D., Reams, P., Johnson, C.A., Karanja, N., Charleston, J.B., Appel, L.J., Maurice, V. and Harsha, D.W., 2010. Overall and minority- focused recruitment strategies in the PREMIER multicenter trial of lifestyle interventions for blood pressure control. *Contemporary clinical trials*, 31(1), pp.49-54.

Kenward, M.G. and Molenberghs, G., 2009. Last observation carried forward: a crystal ball?. *Journal of biopharmaceutical statistics*, 19(5), pp.872-888.

Kim, J.Y., Oh, D.J., Yoon, T.Y., Choi, J.M. and Choe, B.K., 2007. The impacts of

obesity on psychological well-being: a cross-sectional study about depressive mood and quality of life. *J Prev Med Public Health*, 40(2), pp.191-195.

Kitzinger, J., 1995. Qualitative research: introducing focus groups. *Bmj*, 311(7000), pp.299-302.

Krebs, N.F., Himes, J.H., Jacobson, D., Nicklas, T.A., Guilday, P. and Styne, D., 2007. Assessment of child and adolescent overweight and obesity. *Pediatrics*, 120(Supplement 4), pp.S193-S228.

Krebs, P., Prochaska, J.O. and Rossi, J.S., 2010. A meta-analysis of computer-tailored interventions for health behavior change. *Preventive medicine*, 51(3-4), pp.214-221.

Krueger, R. A. 1994. *Focus groups: A practical guide for applied research* (2nd ed.). Thousand Oaks, CA: Sage.

Krueger, R.A. and Casey, M.A., 2014. *Focus groups: A practical guide for applied research*. Sage publications.

Kumanyika SK.2008. Review Environmental influences on childhood obesity: ethnic and cultural influences in context. *Physiol Behav.* 22; 94(1):61-70.

Larsen, R.N., Mann, N.J., Maclean, E. and Shaw, J.E., 2011. The effect of high-protein, low-carbohydrate diets in the treatment of type 2 diabetes: a 12 month randomised controlled trial. *Diabetologia*, 54(4), pp.731-740.

Lawrence, J.M., Devlin, E., Macaskill, S. et al. 2007. Factors that affect the food choices made by girls and young women, from minority ethnic groups, living in the UK. *Journal of Human Nutrition and Dietetics* 20: 311–9.

Layman, D.K., 2003. The role of leucine in weight loss diets and glucose homeostasis. *The Journal of nutrition*, 133(1), pp. 261S-267S

Lin, W.Y., Wu, C.H., Chu, N.F. and Chang, C.J., 2009. Efficacy and safety of very-low-calorie diet in Taiwanese: a multicenter randomized, controlled trial. *Nutrition*, 25(11-12), pp.1129-1136.

Liu-Seifert, H., Zhang, S., D'Souza, D. and Skljarevski, V., 2010. A closer look at the baseline-observation-carried-forward (BOCF). *Patient preference and*

adherence, 4, p.11.

Lear, H., Eboh, W. and Diack, L., 2018. A nurse researcher's guide to reflexive interviewing. *Nurse Researcher (2014+)*, 25(4), p.35.

Leung, F.H. and Savithiri, R., 2009. Spotlight on focus groups. *Canadian Family Physician*, 55(2), pp.218-219.

Levine, M.P. and Smolak, L., 2006. *The prevention of eating problems and eating disorders: Theory, research, and practice*. psychology press.

Levitt, N.S. 2008. Diabetes in Africa: epidemiology, management and healthcare challenges. *Heart*, 94:1376-82.

Lewis, FM., editors. *Health Behavior and Health Education: Theory, Research, and Practice*. 3.

Lewis, J.L. and Sheppard, S.R., 2006. Culture and communication: can landscape visualization improve forest management consultation with indigenous communities? *Landscape and Urban Planning*, 77(3), pp.291-313.

Lim, S.S., Vos, T., Flaxman, A.D., Danaei, G., Shibuya, K., Adair-Rohani, H., AlMazroa, M.A., Amann, M., Anderson, H.R., Andrews, K.G. and Aryee, M., 2012. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The lancet*, 380(9859), pp.2224-2260.

Lin, W.Y., Wu, C.H., Chu, N.F. and Chang, C.J., 2009. Efficacy and safety of very-low-calorie diet in Taiwanese: a multicenter randomized, controlled trial. *Nutrition*, 25(11-12), pp.1129-1136.

Liu, X., Zhang, G., Ye, X., Li, H., Chen, X., Tang, L., Feng, Y., Shai, I., Stampfer, M.J., Hu, F.B. and Lin, X., 2013. Effects of a low-carbohydrate diet on weight loss and cardiometabolic profile in Chinese women: a randomised controlled feeding trial. *British Journal of Nutrition*, 110(8), pp.1444-1453.

Liu, W., Gerdtz, M. and Manias, E., 2016. Creating opportunities for interdisciplinary collaboration and patient-centred care: how nurses, doctors,

pharmacists and patients use communication strategies when managing medications in an acute hospital setting. *Journal of clinical nursing*, 25(19-20), pp.2943-2957.

Lofton KL, Connell CL, Yadrick MK, Brown D, Bounds W, Sims P et al. 2007. African American women's perceptions of their own weight status compared to measured weight status. *FASEB J*; 21:A1057

Lopriore, C. and Muehlhoff, E., 2003. Food security and nutrition trends in West Africa. Challenges and the way forward. FAO, Rome, Italy.

Loviglio, D., 2012. When to use a Focus Group and when not to. Interview with J. Francis, 21.

Ludwig, D.S., 2002. The glycemic index: physiological mechanisms relating to obesity, diabetes, and cardiovascular disease. *Jama*, 287(18), pp.2414-2423

LUKE, A. et al., 2001. Heritability of obesity-related traits among Nigerians, Jamaicans and US black people. *International journal of obesity*, 25(7), pp. 1034-1041

Luppino, F.S., de Wit, L.M., Bouvy, P.F., Stijnen, T., Cuijpers, P., Penninx, B.W. and Zitman, F.G., 2010. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. *Archives of general psychiatry*, 67(3), pp.220-229.

Lynch, M., 2000. Against reflexivity as an academic virtue and source of privileged knowledge. *Theory, Culture & Society*, 17(3), pp.26-54.

Lyon, L.M. & L.H. Hardesty., 2005. Traditional healing in the contemporary life of the Antanosy people of Madagascar. *Ethnobotany Research and Applications* 3:287-294

Mabry, I.R., Young, D.R., Cooper, L.A., Meyers, T., Joffe, A. and Duggan, A.K., 2003. Physical activity attitudes of African American and white adolescent girls. *Ambulatory Pediatrics*, 3(6), pp.312-316.

MacIntyre, U.E., Kruger, H.S., Venter, C.S. and Vorster, H.H., 2002. Dietary intakes of an African population in different stages of transition in the North West

Province, South Africa: the THUSA study. *Nutrition Research*, 22(3), pp.239-256.

Madzima, D. 2013. Sadza ne Nyama: A Shona Staple Dish. Available at: <http://www.theeye.co.zw/sadza-ne-nyama-a-shona-staple-dish-0830808/>

Malnick SDH and Knobler H. 2006. The medical complications of obesity. *Q J Med*; 99:565–579. Available at: <http://qjmed.oxfordjournals.org/content/qjmed/99/9/565.full.pdf>

Mason, J., 2006. Mixing methods in a qualitatively driven way. *Qualitative research*, 6(1), pp.9-25.

McAuley, E., Jerome, G.J., Elavsky, S., Marquez, D.X. and Ramsey, S.N., 2003. Predicting long-term maintenance of physical activity in older adults. *Preventive medicine*, 37(2), pp.110-118.

Mitchell, N.S. and Polsky, S., 2013. Innovative Care Delivery Model to Address Obesity in Older African-American Women: Senior Wellness Initiative and Take Off Pounds Sensibly Collaboration for Health (SWITCH). *Journal of the American Geriatrics Society*, 61(11), pp.1971-1975.

Mitton, L. and Aspinall, P., 2010. Black Africans in England: A diversity of integration experiences. In *Ethnicity and Integration* (pp. 179-202). Springer, Dordrecht

Moghaddam, F.M., Walker, B.R. and Harre, R., 2003. Cultural distance, levels of abstraction, and the advantages of mixed methods. *Handbook of mixed methods in social and behavioral research*, pp.111-134.

MORI Social Research Institute 2003. Learning for everyone: Depth analysis of textual responses to NHSU's development plan, NHSU. Available from: [http://www.nhsu.nhsu.nhs.uk/pls/portal/docs/PAGE/NHSU/NEWS_CENTRE/DOCUMENTS/DOCUMENTS_REGION_2/MORI_ANALYSIS_OF_WRITTEN.PDF](http://www.nhsu.nhs.uk/pls/portal/docs/PAGE/NHSU/NEWS_CENTRE/DOCUMENTS/DOCUMENTS_REGION_2/MORI_ANALYSIS_OF_WRITTEN.PDF)

[http://www.nhsu.nhsu.nhs.uk/pls/portal/docs/PAGE/NHSU/NEWS_CENTRE/DOCUMENTS/DOCUMENTS_REGION_2/MORI_ANALYSIS_OF_WRITTEN.PDF](http://www.nhsu.nhs.uk/pls/portal/docs/PAGE/NHSU/NEWS_CENTRE/DOCUMENTS/DOCUMENTS_REGION_2/MORI_ANALYSIS_OF_WRITTEN.PDF)

Martin, C.K., Rosenbaum, D., Han, H., Geiselman, P.J., Wyatt, H.R., Hill, J.O., Brill, C., Bailer, B., Miller-III, B.V., Stein, R. and Klein, S., 2011. Change in food cravings, food preferences, and appetite during a low-carbohydrate and low-fat

diet. *Obesity*, 19(10), pp.1963-1970.

Martin, P.D., Rhode, P.C., Dutton, G.R., Redmann, S.M., Ryan, D.H. and Brantley, P.J., 2006. A primary care weight management intervention for low-income African-American women. *Obesity*, 14(8), pp.1412-1420.

Mauthner, N. S., Doucet, A., 1998. Reflections on a voice centered relational method of data analysis: Analysing maternal and domestic voices. In Ribbens, J., Edwards, R. (Eds.), *Feminist dilemmas in qualitative research: Public knowledge and private lives* (pp. 119–146). London, England: Sage.

Mauthner, N.S. and Doucet, A., 2003. Reflexive accounts and accounts of reflexivity in qualitative data analysis. *Sociology*, 37(3), pp.413-431.

Mbanya, J.C.N., Motala, A.A., Sobngwi, E., Assah, F.K. and Enoru, S.T., 2010. Diabetes in sub-saharan africa. *The lancet*, 375(9733), pp.2254-2266.

Mc Morrow, L., Ludbrook, A., Macdiarmid, J.I. and Olajide, D., 2016. Perceived barriers towards healthy eating and their association with fruit and vegetable consumption. *Journal of Public Health*, 39(2), pp.330-338.

McLean, C.A. and Campbell, C.M., 2003. Locating research informants in a multi-ethnic community: ethnic identities, social networks and recruitment methods. *Ethnicity and health*, 8(1), pp.41-61.

McNair, R., Taft, A. and Hegarty, K., 2008. Using reflexivity to enhance in-depth interviewing skills for the clinician researcher. *BMC Medical Research Methodology*, 8(1), p.73.

Metcalf, P.A., Scragg, R.K.R., Willoughby, P., Finau, S. and Tipene-Leach, D., 2000. Ethnic differences in perceptions of body size in middle-aged European, Maori and Pacific people living in New Zealand. *International journal of obesity*, 24(5), p.593.

Michie, S. and Abraham, C., 2004. Interventions to change health behaviours: evidence- based or evidence-inspired? *Psychology & Health*, 19(1), pp.29-49.

Middleton, K.R., Anton, S.D. and Perri, M.G., 2013. Long-term adherence to health

behavior change. *American journal of lifestyle medicine*, 7(6), pp.395-404.

Miles, M.B., Huberman, A.M., Huberman, M.A. and Huberman, M., 1994. *Qualitative data analysis: An expanded sourcebook*. sage.

Millstein, R.A., Carlson, S.A., Fulton, J.E., Galuska, D.A., Zhang, J., Blanck, H.M. and Ainsworth, B.E., 2008. Relationships between body size satisfaction and weight control practices among US adults. *The Medscape Journal of Medicine*, 10(5), p.119.

Mintel. 2009. Ethnic cuisine. *Mintel Marketing Intelligence*. Available at: http://store.mintel.com/industries/food-and-foodservice/food/ethnic-foods?cookie_test=true

Mishler, E.G. (1986) *Research Interviewing: Context and Narrative*. Cambridge, MA: Harvard University Press .

Monda, K., E North, K., C Hunt, S., Rao, D.C., A Province, M. and T Kraja, A., 2010. The genetics of obesity and the metabolic syndrome. *Endocrine, Metabolic & Immune Disorders-Drug Targets (Formerly Current Drug Targets-Immune, Endocrine & Metabolic Disorders)*, 10(2), pp.86-108.

Montesi, L., El Ghoch, M., Brodosi, L., Calugi, S., Marchesini, G. and Dalle Grave, R., 2016. Long-term weight loss maintenance for obesity: a multidisciplinary approach. *Diabetes, metabolic syndrome and obesity: targets and therapy*, 9, p.37.

Monyeki, K., Kemper, H. and Twisk, J., 2010. Trends in obesity and hypertension in South African youth. *Childhood obesity prevention International Research, controversies and interventions*, , pp. 44-151

Morgan, David L. 1997. *Focus groups as qualitative research*. Newbury Park, CA: Sage.

Morrison-Beedy, D., Côté-Arsenault, D. and Feinstein, N.F., 2001. Maximizing results with focus groups: Moderator and analysis issues. *Applied Nursing Research*, 14(1), pp.48-53.

Morse, J.M., 1991. *Approaches to qualitative-quantitative methodological*

triangulation. *Nursing Research*, 40, pp.120-122.

Munt, A.E., Partridge, S.R. and Allman-Farinelli, M., 2017. The barriers and enablers of healthy eating among young adults: a missing piece of the obesity puzzle: a scoping review. *Obesity reviews*, 18(1), pp.1-17.

Mvo, Z J. Dick, K. Steyne. 1999. Perceptions of overweight African women about acceptable body size of women and children *Curationis*, 22 : 27–31

Nadin, S. and Cassell, C., 2006. The use of a research diary as a tool for reflexive practice: Some reflections from management research. *Qualitative Research in Accounting & Management*, 3(3), pp.208-217.

National Collaborating Centre for Primary Care (NICE) 2006. *Obesity: The Prevention, Identification, Assessment and Management of Overweight and Obesity in Adults and Children*. London: National Institute for Health and Clinical Excellence (NICE).

National Obesity Observatory (NOO). 2011. *Obesity and Ethnicity*. http://www.noo.org.uk/uploads/doc/vid_9444_Obesity_and_ethnicity_270111.pdf

National Records of Scotland. 2018. *Education: Scotland's Census – 2011. Shaping our future*. Available at: <https://www.scotlandscensus.gov.uk/education-0>

National Research Council, 2010. *The prevention and treatment of missing data in clinical trials*. National Academies Press.

National Task Force on the Prevention and Treatment of Obesity., 1993. Very low-calorie diets. *JAMA*, 270:967-74.

Ndebele S. Zimbabwe: Countries and their Cultures. Available at: <http://www.everyculture.com/To-Z/Zimbabwe.html> Accessed December, 2014.

Neupane, S., Prakash, K.C. and Doku, D.T., 2014. Overweight and obesity among women: analysis of demographic and health survey data from 32 Sub-Saharan African Countries. *BMC Public Health*, 16(1), p.30.

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., Mullany, E.C., Biryukov, S., Abbafati, C., Abera, S.F. and Abraham, J.P., 2014. Global,

regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, 384(9945), pp.766-781.

Njelekela, M.A., Mpenbeni, R., Muhihi, A., Mligiliche, N.L., Spiegelman, D., Hertzmark, E., Liu, E., Finkelstein, J.L., Fawzi, W.W., Willett, W.C. and Mtabaji, J., 2009. Gender-related differences in the prevalence of cardiovascular disease risk factors and their correlates in urban Tanzania. *BMC cardiovascular disorders*, 9(1), p.30.

NOAW, 2014. Obesity in the UK: Analysis and Expectations. Available at: <http://www.nationalobesityforum.org.uk/media/PDFs/StateOfTheNationsWaistlineObesityintheUKAnalysisandExpectations.pdf>

Nohlert, E., Öhrvik, J., Tegelberg, Å., Tillgren, P. and Helgason, Á.R., 2013. Long-term follow-up of a high-and a low-intensity smoking cessation intervention in a dental setting—a randomized trial. *BMC Public Health*, 13(1), p.592.

Nordmann, A.J., Nordmann, A., Briel, M., Keller, U., Yancy, W.S., Brehm, B.J. and Bucher, H.C., 2006. Effects of low-carbohydrate vs low-fat diets on weight loss and cardiovascular risk factors: a meta-analysis of randomized controlled trials. *Archives of internal medicine*, 166(3), pp.285-293.

Nyumba, T., Wilson, K., Derrick, C.J. and Mukherjee, N., 2018. The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*, 9(1), pp.20-32.

O.E.C.D., 2015. Health at a Glance 2011. OECD Indicators, OECD Publishing, Paris. DOI: https://doi.org/10.1787/health_glance-2015-en. Accessed February, 15, p.2016.

O.E.C.D., Health at a glance 2017: OECD Indicators, OECD Publishing, Paris, 2017. doi: 10.1787/health_glance-2017-en

Office of National Statistics, 2011. 2011 Census analysis: Ethnicity and religion of the non-UK born population in England and Wales: 2011.

Ogana, W.N. and Ojong, V.B., 2013. The thin/thick body ideal: Zulu women's body

- as a site of cultural and postcolonial feminist struggle. *Agenda*, 27(4), pp.110-119.
- Ogden, C.L., Carroll, M.D., Curtin, L.R., McDowell, M.A., Tabak, C.J. and Flegal, K.M., 2006. Prevalence of overweight and obesity in the United States, 1999-2004. *Jama*, 295(13), pp.1549-1555.
- Ogden, C.L., Yanovski, S.Z., Carroll, M.D. and Flegal, K.M., 2007. The epidemiology of obesity. *Gastroenterology*, 132(6), pp.2087-2102.
- Ogden, J. and Clementi, C., 2010. The experience of being obese and the many consequences of stigma. *Journal of obesity*, 2010.
- Oldroyd, J., Banerjee, M., Heald, A. and Cruickshank, K., 2005. Diabetes and ethnic minorities. *Postgraduate medical journal*, 81(958), pp.486-490.
- Oliveira, D.L.D., 2011. The use of focus groups to investigate sensitive topics: an example taken from research on adolescent girls' perceptions about sexual risks. *Ciência & Saúde Coletiva*, 16(7), pp.3093-3102.
- Oltmann, S.M., 2016. Qualitative interviews: A methodological discussion of the interviewer and respondent contexts. In *Forum: Qualitative Social Research* (Vol. 17, No. 2, p. 1).
- Onayemi, F., 2004. Ethnic Identity, the concept of female beauty and conflict in classical and African cultures (No. 12). *Programme on Ethnic and Federal Studies (PEFS)*.
- O'Neill, J.W., 2012. Using focus groups as a tool to develop a hospitality work-life research study. *International Journal of Contemporary Hospitality Management*, 24(6), pp.873-885.
- Osei-Assibey, G. and Boachie, C., 2012. Dietary interventions for weight loss and cardiovascular risk reduction in people of African ancestry (blacks): a systematic review. *Public health nutrition*, 15(1), pp.110-115.
- Osei-Kwasi, H.A., Powell, K., Nicolaou, M. and Holdsworth, M., 2017. The influence of migration on dietary practices of Ghanaians living in the United Kingdom: A qualitative study. *Annals of human biology*, 44(5), pp.454-463.
- Overstreet, N.M., Quinn, D.M. and Agocha, V.B., 2010. Beyond thinness: The

influence of a curvaceous body ideal on body dissatisfaction in Black and White women. *Sex roles*, 63(1-2), pp.91-103.

Paliadelis, P. and Cruickshank, M., 2008. Using a voice-centered relational method of data analysis in a feminist study exploring the working world of nursing unit managers. *Qualitative Health Research*, 18(10), pp.1444-1453.

Palinkas, L.A., Horwitz, S.M., Green, C.A., Wisdom, J.P., Duan, N. and Hoagwood, K., 2015. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, 42(5), pp.533-544.<https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/s12874-016-0114-6>

Parikh M, Lo H, Chang C et al. 2006. Comparison of outcomes after laparoscopic adjustable gastric banding in African-Americans and whites. *Surg Obes Relat Dis* 2, 607– 610

Parks, E.J. and Hellerstein, M.K., 2000. Carbohydrate-induced hypertriglycerolemia: historical perspective and review of biological mechanisms. *The American journal of clinical nutrition*, 71(2), pp.412-433.

Patrick, K., Marshall, S.J., Davila, E.P., Kolodziejczyk, J.K., Fowler, J.H., Calfas, K.J., Huang, J.S., Rock, C.L., Griswold, W.G., Gupta, A. and Merchant, G., 2014. Design and implementation of a randomized controlled social and mobile weight loss trial for young adults (project SMART). *Contemporary clinical trials*, 37(1), pp.10-18.

Pawlak, D.B., Ebbeling, C.B. and Ludwig, D.S., 2002. Should obese patients be counselled to follow a low-glycaemic index diet? Yes. *Obesity reviews*, 3(4), pp.235-243.

Pearson, D. and Vossler, A., 2016. Methodological issues in focus group research: The example of investigating counsellors' experiences of working with same-sex couples. *Counselling Psychology Review*, 31(1).

Peters, D.A., 1993. Improving quality requires consumer input: Using focus

groups. *Journal of Nursing Care Quality*, 7(2), pp.34-41

Petrovic, S., Lordly, D., Brigham, S. and Delaney, M., 2015. Learning to listen: An analysis of applying the listening guide to reflection papers. *International Journal of Qualitative Methods*, 14(5), p.1609406915621402.

Pillow, W., 2003. Confession, catharsis, or cure? Rethinking the uses of reflexivity as methodological power in qualitative research. *International journal of qualitative studies in education*, 16(2), pp.175-196.

Pirozzo, S., Summerbell, C., Cameron, C. and Glasziou, P., 2003. Should we recommend low-fat diets for obesity?. *Obesity Reviews*, 4(2), pp.83-90.

Pi-Sunyer, X., 2009. The medical risks of obesity. *Postgraduate medicine*, 121(6), pp.21- 33.

Pogozelski, W., Arpaia, N. and Priore, S., 2005. The metabolic effects of low-carbohydrate diets and incorporation into a biochemistry course. *Biochemistry and Molecular Biology Education*, 33(2), pp. 91-100

Polit, D. F., Beck, C. T. 2014. *Essentials of nursing research: Appraising evidence for nursing practice*. Philadelphia, PA: Wolters Kluwer/Lippincott/Williams & Wilkins Health

Pool, R., Montgomery, C.M., Morar, N.S., Mweemba, O., Ssali, A., Gafos, M., Lees, S., Stadler, J., Crook, A., Nunn, A. and Hayes, R., 2010. A mixed methods and triangulation model for increasing the accuracy of adherence and sexual behaviour data: the Microbicides Development Programme. *PloS one*, 5(7), p.e11600.

Popenoe, R., 2003. *Feeding desire: Fatness and beauty in the Sahara*. London: Routledge

Popkin, B.M., 2002. The shift in stages of the nutrition transition in the developing world differs from past experiences! *Public health nutrition*, 5(1A), pp.205-214.

Popkin, B.M., 2006. Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases-. *The American journal of clinical nutrition*, 84(2), pp.289-298.

Povey, R., Conner, M., Sparks, P., James, R. and Shepherd, R., 1999. A critical

examination of the application of the Transtheoretical Model's stages of change to dietary behaviours. *Health Education Research*, 14(5), pp.641-651.

Prentice, A.M., 2005. The emerging epidemic of obesity in developing countries. *International journal of epidemiology*, 35(1), pp.93-99.

Prochaska, J.O. and DiClemente, C.C., 1983. Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of consulting and clinical psychology*, 51(3), p.390.

Prochaska, J.O., DiClemente, C.C. and Norcross, J.C., 1992. In search of how people change: applications to addictive behaviors. *American psychologist*, 47(9), p.1102.

Puoane, T., Hughes, G. and Bradley, H.A., 2005. Obesity among black South African women.

Rajpathak, S.N., Kumbhani, D.J., Crandall, J., Barzilai, N., Alderman, M. and Ridker, P.M., 2009. Statin therapy and risk of developing type 2 diabetes: a meta-analysis. *Diabetes care*, 32(10), pp.1924-1929.

Read, S., Ashman, M., Scott, C. & Savage, J. 2004. Evaluation of the modern matron role in a sample of NHS trusts, Royal College of Nursing Institute. Available from: http://www.rcn.org.uk/publications/pdf/mm_exec.pdf

Reichardt, C. S., & Rallis, S. F. (Eds.), 1994. *The qualitative-quantitative debate: New perspectives*. San Francisco: Jossey-Bass

Rennie, K.L. and Jebb, S.A., 2005. Prevalence of obesity in Great Britain. *Obesity reviews*, 6(1), pp.11-12.

Renzaho, A.M., 2004. Fat, rich and beautiful: changing socio-cultural paradigms associated with obesity risk, nutritional status and refugee children from sub-Saharan Africa. *Health & place*, 10(1), pp.105-113.

Rguibi, R. & Belahsen, M. 2006. Fattening Practices Among Moroccan Saharawi Women. *Eastern Mediterranean Health Journal*, 12(5), 619-24

Rhodes RE, Courneya KS. Differentiating motivation and control in the Theory of

- Planned Behavior. *Psychology, Health & Medicine*. 2004; 9(2):205–215
- Richards, L., Morse, J. M., 2007. *Readme first for a user's guide to qualitative methods* (2nd ed). Thousand Oaks, CA: Sage.
- Rienzo, C., 2013. Characteristics and outcomes of migrants in the UK labour market. *Migration Observatory Briefing*.
- Riessman, C.K., 2008. *Narrative methods for the human sciences*. Sage.
- Ritchie, J. and Spencer, L., 2002. Qualitative data analysis for applied policy research. In *Analyzing qualitative data* (pp. 187-208). Routledge.
- Ritchie, J., Lewis, J., Nicholls, C.M. and Ormston, R. eds., 2013. *Qualitative research practice: A guide for social science students and researchers*. Sage.
<https://www.ajol.info/index.php/majohe/article/download/90214/79643>
- Roberts, A., Feingold, A., Cash, T.F. & Johnson, B.T. 2006. Are black-white differences in females' body dissatisfaction decreasing? A meta-analytic review *J. Consult. Clin. Psychol.*, 74, 1121–1131.
- Robertson, A.M., Broom, J., Mcrobbie, L.J. and Maclennan, G.S., 2002. Low carbohydrate diets in treatment resistant overweight patients with Type 2 diabetes. *Diabetic Medicine*, 19(Suppl. 2), pp. 24
- Robinson SA, Webb JB and Butler-Ajibade PT. 2011. Body Image and Modifiable Weight Control Behaviors among Black females: a Review of the Literature. *Obesity* 20, 241–252
- Robinson, J. M., & Trochim, W. M. K., 2007. An examination of community members', researchers' and health professionals' perceptions of barriers to minority participation in medical research: An application of concept mapping. *Ethnicity and Health*, 12, 521–539
- Rodriguez, K.L., Schwartz, J.L., Lahman, M.K. and Geist, M.R., 2011. Culturally responsive focus groups: Reframing the research experience to focus on participants. *International Journal of Qualitative Methods*, 10(4), pp.400-417.
- Rolland, C., Hession, M., Murray, S., Wise, A. and Broom, I., 2009. Randomized clinical trial of standard dietary treatment versus a low-carbohydrate/high-protein

diet or the LighterLife Programme in the management of obesity. *Journal of diabetes*, 1(3), p.207- 217.

Rolls, L. and Relf, M., 2006. Bracketing interviews: Addressing methodological challenges in qualitative interviewing in bereavement and palliative care. *Mortality*, 11(3), pp.286-305.

Rubin J (2008) *Perfect Weight South Africa*, Lake Mary, Fla: Strangest Books.

Rutter, J. and Latorre, M., 2009. Migration, migrants and inequality. *Towards a More Equal Society*, pp. 201-220

Rydén, P.J. and Sydner, Y.M., 2011. Implementing and sustaining dietary change in the context of social relationships. *Scandinavian journal of caring sciences*, 25(3), pp.583- 590.

Saha, C. and Jones, M.P., 2009. Bias in the last observation carried forward method under informative dropout. *Journal of Statistical Planning and Inference*, 139(2), pp.246- 255.

Saksvig, B.I., Gittelsohn, J., Harris, S.B., Hanley, A.J., Valente, T.W. and Zinman, B., 2005. A pilot school-based healthy eating and physical activity intervention improves diet, food knowledge, and self-efficacy for native Canadian children. *The Journal of nutrition*, 135(10), pp.2392-2398.

Sallis, J.F., Calfas, K.J., Alcaraz, J.E., Gehrman, C. and Johnson, M.F., 1999. Potential mediators of change in a physical activity promotion course for university students: Project GRAD. *Annals of Behavioral Medicine*, 21(2), p.149.

Samaha, F.F., Iqbal, N., Seshadri, P., Chicano, K.L., Daily, D.A., McGrory, J., Williams, T., Williams, M., Gracely, E.J. and Stern, L., 2003. A low-carbohydrate as compared with a low-fat diet in severe obesity. *New England Journal of Medicine*, 348(21), pp.2074- 2081.

Saturni, S., Bellini, F., Braido, F., Paggiaro, P.I.E.R., Sanduzzi, A., Scichilone, N., Santus, P.A., Morandi, L. and Papi, A., 2014. Randomized controlled trials and real life studies.

Approaches and methodologies: a clinical point of view. *Pulmonary pharmacology*

& therapeutics, 27(2), pp.129-138.

Scarborough, P., Bhatnagar, P., Wickramasinghe, K.K., Allender, S., Foster, C. and Rayner, M., 2011. The economic burden of ill health due to diet, physical inactivity, smoking, alcohol and obesity in the UK: an update to 2006–07 NHS costs. *Journal of public health*, 33(4), pp.527-535.

Schlicht, C. K. and Haglund, K. 2015. Weight Loss Intervention Efficacy among Black Women. *The Journal for Nurse Practitioners*: 717-727.

Schofield, W.N., 1985. Predicting basal metabolic rate, new standards and review of previous work. *Human Nutrition. Clinical Nutrition*, 39 (Suppl 1), pp. 5-41.

School of Nursing and Midwifery 2002. Care Plus Final Report 2002, University of Sheffield. Available from: <http://www.shef.ac.uk/c/careplus/final.pdf>

Scotland. Scottish Executive, 2004. New Scots: Attracting fresh talent to meet the challenge of growth. Scottish Executive.

Scott, A., Ejikeme, C.S., Clottey, E.N. and Thomas, J.G., 2012. Obesity in sub-Saharan Africa: development of an ecological theoretical framework. *Health promotion international*, 28(1), pp.4-16.

Scottish Government, 2009. Health in our Multi-ethnic Scotland Future Research Priorities Report Summary. The NHS Health Scotland. Available at: http://www.vhscotland.org.uk/library/nhs/Health_in_our_multi-ethnic_Scotland_full_report.pdf

Scottish Government, 2010. Preventing overweight and obesity in Scotland: A route map towards healthy weight. Available at: <https://www.gov.scot/publications/preventing-overweight-obesity-scotland-route-map-towards-healthy-weight/>

Scottish Government. 2011. Scottish Health and Ethnicity Research Strategy Steering (SHERSS) group. Available at: <http://www.healthscotland.com/uploads/documents/18297-SHERSS%20annual%20report.pdf>

Scottish Intercollegiate Guidelines networks. (SIGN), 2010. Management of Diabetes. A national clinical guideline. Report 116. Edinburgh: Scottish

Intercollegiate Guideline Network.

Seale, C., 1999. Quality in qualitative research. *Qualitative inquiry*, 5(4), pp.465-478.

Segal, L.J. and Martin, A., 2016. *The State of Obesity: Better Policies for a Healthier America 2016*. Robert Wood Johnson Foundation.

Seguin, R., Connor, L., Nelson, M., LaCroix, A. and Eldridge, G., 2014. Understanding barriers and facilitators to healthy eating and active living in rural communities. *Journal of nutrition and metabolism*, 2014.

Sellahewa L, Khan C, Lakkunarajah S, Idris I. 2017. A Systematic Review of Evidence on the Use of Very Low-Calorie Diets in People with Diabetes. *Curr Diabetes Rev.* 13(1):35- 46

Serrant—Green, L., 2002. methodological issues for black researchers working in minority ethnic. *Nurse researcher*, 9(4), p.4.

Serrant-Green, L., 2010. Introduction and overview of research with Black families.

Shao, J., Jordan, D.C. and Pritchett, Y.L., 2009. Baseline observation carry forward: reasoning, properties, and practical issues. *Journal of biopharmaceutical statistics*, 19(4), pp.672-684.

Shapses, S.A., Von Thun, N.L., Heymsfield, S.B., Ricci, T.A., Ospina, M., Pierson JR, R.N. and Stahl, T., 2001. Bone turnover and density in obese premenopausal women during moderate weight loss and calcium supplementation. *Journal of Bone and Mineral Research*, 16(7), pp.1329-1333

Shavers, V.L., Lynch, C.F. and Burmeister, L.F., 2002. Racial differences in factors that influence the willingness to participate in medical research studies. *Annals of epidemiology*, 12(4), pp.248-256.

Shoop, S.J.W., 2015. Should we Ban the use of 'Last Observation Carried forward' Analysis in Epidemiological Studies? *SM J Public Health Epidemiol*;1(1):1004.

Siervo, M., Grey, P., Nyan, O.A. and Prentice, A.M., 2006. Urbanization and obesity in The Gambia: a country in the early stages of the demographic transition.

European journal of clinical nutrition, 60(4), p.455.

Singh, S.K., 2012. Post-prandial hyperglycemia. *Indian journal of endocrinology and metabolism*, 16(Suppl 2), p.S245

Smith, D. W., & McFall, S. L. (2005). The relationship of diet and exercise for weight control and the quality of life gap associated with diabetes. *Journal of Psychosomatic Research*, 59, 385-392.

Smith, A.D., 2009. Girls being force-fed for marriage as fattening farms revived. URL <http://www.guardian.co.uk/world/2009/mar/01/mauritania-force-feeding-marriage> (accessed September 2010).

Smith, J.K., 1983. Quantitative versus qualitative research: An attempt to clarify the issue. *Educational researcher*, 12(3), pp.6-13.

Sommer Harrits, G., 2011. More than method?: A discussion of paradigm differences within mixed methods research. *Journal of mixed methods research*, 5(2), pp.150-166.

Sondike, S.B., Copperman, N. and Jacobson, M.S., 2003. Effects of a low-carbohydrate diet on weight loss and cardiovascular risk factor in overweight adolescents. *The Journal of pediatrics*, 142(3), pp.253-258.

Sorsoli, L. and Tolman, D.L., 2008. Hearing voices: Listening for multiplicity and movement in interview data.

Sproston K, Mindell J., 2006. *Health Survey for England 2004: Volume 1: Health of minority ethnic groups*. London: The Information Centre, 2006.

Srivastava, A. and Thomson, S.B., 2009. Framework analysis: a qualitative methodology for applied policy research.

Standley, R., Sullivan, V. & Wardle, J. 2009. Self-perceived weight in adolescents: over- estimation or under-estimation? *Body Image*, 6, 56-59.

Stanley, L., 2002. Shadows lying across her pages: epistolary aspects of reading 'the eventful I' in Olive Schreiner's letters. *Journal of European studies*, 32(125-126), pp.251- 266.

Starks, H. and Brown Trinidad, S., 2007. Choose your method: A comparison of

phenomenology, discourse analysis, and grounded theory. *Qualitative health research*, 17(10), pp.1372-1380.

Stephenson WB. 2011. The experiences of Obese African American Women and their utilization of preventive healthcare services. *Nursing Dissertations: Georgia State University*. Available at: http://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1020&context=nursing_diss

Stern, L., Iqbal, N., Seshadri, P., Chicano, K.L., Daily, D.A., McGrory, J., Williams, M., Gracely, E.J. and Samaha, F.F., 2004. The effects of low-carbohydrate versus conventional weight loss diets in severely obese adults: one-year follow-up of a randomized trial. *Annals of internal medicine*, 140(10), pp.778-785.

Stewart, A., Marfell-Jones, M., Olds, T. & de Ridder, H. (2011). *International Standards for Anthropometric Assessment*. International Society for the Advancement of Kinanthropometry, Lower Hutt, New Zealand. 125pp.

Steyn NP and Mchiza ZJ. 2014. Obesity and the nutrition transition in Sub-Saharan Africa. *Ann. N.Y. Acad. Sci.* 1311:88-101.

Strychar, I., 2006. Diet in the management of weight loss. *Canadian Medical Association journal*, 174(1), pp. 56-63

Suri, H., 2011. Purposeful sampling in qualitative research synthesis. *Qualitative research journal*, 11(2), pp.63-75.

Svenaesus, Fredrik. "Phenomenology of medicine." *The Blackwell Companion to phenomenology and Existentialism*. London: Blackwell (2006): 412-24.

Svetkey, L.P., Erlinger, T.P., Vollmer, W.M., Feldstein, A., Cooper, L.S., Appel, L.J., Ard, J.D., Elmer, P.J., Harsha, D. and Stevens, V.J., 2005. Effect of lifestyle modifications on blood pressure by race, sex, hypertension status, and age. *Journal of human hypertension*, 19(1), p.21.

Swami, V., Airs, N., Chouhan, B., Amparo Padilla Leon, M. and Towell, T., 2009. Are there ethnic differences in positive body image among female British undergraduates? *European Psychologist*, 14(4), pp.288-296.

Swanson, G.M. and Ward, A.J., 1995. Recruiting minorities into clinical trials

toward a participant-friendly system. *JNCI Journal of the National Cancer Institute*, 87(23), pp.1747-1759.

Swanson, M., Schoenberg, N.E., Davis, R., Wright, S. and Dollarhide, K., 2013. Perceptions of healthful eating and influences on the food choices of Appalachian youth. *Journal of nutrition education and behavior*, 45(2), pp.147-153.

Szolnoki, G. and Hoffmann, D., 2013. Online, face-to-face and telephone surveys—Comparing different sampling methods in wine consumer research. *Wine Economics and Policy*, 2(2), pp.57-66.

Tabary, Z. 2018. In Mauritania, force feeding leaves young girls with long-term problems. NewsDeeply. Malnutrition Deeply. Available at: <https://www.newsdeeply.com/malnutrition/articles/2018/04/12/in-mauritania-force-feeding-leaves-young-girls-with-long-term-problems>

Tashakkori, A. and Creswell, J., 2007. Exploring the nature of research questions in mixed method research. *Journal of Mixed Methods Research*, 1(3), pp.207-211.

Tashakkori, A. and Teddlie, C., 1998. Mixed methodology: Combining the qualitative and quantitative approaches. *Applied Social Research Methods*, No. 46. Thousand Oaks, California: Sage Publications.

Tashakkori, A. and Teddlie, C., 2003. Major issues and controversies in the use of mixed methods in the social and behavioral sciences. *Handbook of mixed methods in social and behavioral research*, pp.3-50.

Taylor, G.R. and Trumbull, M., 2005. Developing a multi-faced research design/paradigm. Integrating quantitative and qualitative methods in research (2nd ed). University press of America.

Team, L.S. and Niblett, P., 2015. Statistics on obesity, physical activity and diet. Health and Social Care Information Centre. London, pp.104-110.

Teddlie, C. and Tashakkori, A., 2003. Major issues and controversies in the use of mixed methods in the social and behavioral sciences. *Handbook of mixed methods in social & behavioral research*, pp.3-50.

Teddlie, C. and Tashakkori, A., 2009. Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral

sciences. Sage.

The Scottish Government. 2014. Ethnicity. Available at: <http://www.scotland.gov.uk/Topics/People/Equality/Equalities/datagrid>

Thirsk, L.M. and Clark, A.M., 2017. Using qualitative research for complex interventions: the contributions of hermeneutics. *International Journal of Qualitative Methods*, 16(1), p.1609406917721068.

Tiedje, K., Wieland, M.L., Meiers, S.J., Mohamed, A.A., Formea, C.M., Ridgeway, J.L., Asiedu, G.B., Boyum, G., Weis, J.A., Nigon, J.A. and Patten, C.A., 2014. A focus group study of healthy eating knowledge, practices, and barriers among adult and adolescent immigrants and refugees in the United States. *International Journal of Behavioral Nutrition and Physical Activity*, 11(1), p.63..

Tobias, D.K., Chen, M., Manson, J.E., Ludwig, D.S., Willett, W. and Hu, F.B., 2015. Effect of low-fat diet interventions versus other diet interventions on long-term weight change in adults: a systematic review and meta-analysis. *The lancet Diabetes & endocrinology*, 3(12), pp.968-979.

Tognon, G., Lissner, L., Sæbye, D., Walker, K.Z. and Heitmann, B.L., 2014. The Mediterranean diet in relation to mortality and CVD: a Danish cohort study. *British Journal of Nutrition*, 111(1), pp.151-159.

Tongco, D.C. 2007 Purposive Sampling as a tool for Informant Selection. *Ethnobotany Research & Applications* 5:147-158. Available at: <http://scholarspace.manoa.hawaii.edu/bitstream/handle/10125/227/I1547-3465-05-147.pdf>

Tufford, L. and Newman, P., 2012. Bracketing in qualitative research. *Qualitative social work*, 11(1), pp.80-96.

Tussing-Humphreys, L.M., Fitzgibbon, M.L., Kong, A. and Odoms-Young, A., 2013. Weight loss maintenance in African American women: a systematic review of the behavioral lifestyle intervention literature. *Journal of obesity*, 2013.

Ujcic-Voortman, J.K., Schram, M.T., Jacobs-van der Bruggen, M.A., Verhoeff, A.P. and Baan, C.A., 2009. Diabetes prevalence and risk factors among ethnic

- minorities. *The European Journal of Public Health*, 19(5), pp.511-515.
- Untaru, E. 2013. Why do young people prefer fast-food restaurants? An exploratory study. *Journal of Tourism*. L15, L84
- Usman, B., Sharma, N., Satija, S., Mehta, M., Vyas, M., Khatik, G.L., Khurana, N., Hansbro, P.M., Williams, K. and Dua, K., 2019. Recent Developments in Alpha-Glucosidase Inhibitors for Management of Type-2 Diabetes: An Update. *Current pharmaceutical design*, 25(23), pp.2510-2525.
- Uybico, S. J., Pavel, S., & Gross, C. P. (2007). Recruiting vulnerable population into research: A systematic review of recruitment interventions. *Journal of General Internal Medicine*, 22, 852-863.
- Van Loan, M.D., 1998. Is dual-energy X-ray absorptiometry ready for prime time in the clinical evaluation of body composition? *The American Journal of Clinical Nutrition*, 68(6), pp. 1155-1156
- Vogl, S., 2013. Telephone versus face-to-face interviews: Mode effect on semi structured interviews with children. *Sociological Methodology*, 43(1), pp.133-177.
- Volek, J.S., Phinney, S.D., Forsythe, C.E., Quann, E.E., Wood, R.J., Puglisi, M.J., Kraemer, W.J., Bibus, D.M., Fernandez, M.L. and Feinman, R.D., 2009. Carbohydrate restriction has a more favorable impact on the metabolic syndrome than a low fat diet. *Lipids*, 44(4), pp.297-309.
- Vyas, A., Greenhalgh, A., Cade, J., Sanghera, B., Riste, L., Sharma, S. and Cruickshank, K., 2003. Nutrient intakes of an adult Pakistani, European and African-Caribbean community in inner city Britain. *Journal of human nutrition and dietetics*, 16(5), pp.327- 337.
- Wadden, T.A., Vogt, R.A., Foster, G.D. and Anderson, D.A., 1998. Exercise and the maintenance of weight loss: 1-year follow-up of a controlled clinical trial. *Journal of consulting and clinical psychology*, 66(2), p.429.
- Wadden, T., Sternberg, J.A., Letizia, K.A., Stunkard, A.J. and Foster, G.D., 1989. Treatment of obesity by very low calorie diet, behavior therapy, and their combination: a five-year perspective. *International journal of obesity*, 13, pp.39-

46.

Walker, A.R., 1998. Epidemiology and health implications of obesity, with special reference to African populations. *Ecology of food and nutrition*, 37(1), pp.21-55.

Walker, A.R.P., Adam, F. and Walker, B.F., 2001. World pandemic of obesity: the situation in Southern African populations. *Public health*, 115(6), pp.368-372.

Walker, R.E. and Gordon, M., 2014. The use of lifestyle and behavioral modification approaches in obesity interventions for Black women: a literature review. *Health Education & Behavior*, 41(3), pp.242-258.

Wang, Y.C., McPherson, K., Marsh, T., Gortmaker, S.L. and Brown, M., 2011. Health and economic burden of the projected obesity trends in the USA and the UK. *The Lancet*, 378(9793), pp.815-825.

Wardle, J. and Cooke, L., 2005. The impact of obesity on psychological well-being. *Best practice & research clinical endocrinology & metabolism*, 19(3), pp.421-440.

Warren-Findlow, J., Prohaska, T.R. and Freedman, D., 2003. Challenges and opportunities in recruiting and retaining underrepresented populations into health promotion research. *The Gerontologist*, 43(suppl_1), pp.37-46.

Wasserfall, R., 1993. Reflexivity, feminism and difference. *Qualitative Sociology*, 16(1), pp.23-41.

Weathers, B., Barg, F.K., Bowman, M., Briggs, V., Delmoor, E., Kumanyika, S., Johnson, J.C., Purnell, J., Rogers, R. and Halbert, C.H., 2011. Using a mixed-methods approach to identify health concerns in an African American community. *American journal of public health*, 101(11), pp.2087-2092.

Weiss, B.L., 2004. Feeding desire: Fatness and beauty in the Sahara.

West, B., 2004. *Cameroon: The Bradt Travel Guide*. Guilford, Connecticut: The Globe Pequot Press. ISBN 978-1841620787.

West, D.S., Prewitt, T.E., Bursac, Z. and Felix, H.C., 2008. Weight loss of black, white, and Hispanic men and women in the Diabetes Prevention Program. *Obesity*, 16(6), pp.1413-1420.

Westman, E.C., Feinman, R.D., Mavropoulos J.C., Vernon, M.C., Volek, J.S.,

- Worthman, J.A., Yancy, W.S. and Phinney, S.D., 2007. Low-carbohydrate nutrition and metabolism. *The American Journal of Clinical Nutrition*, 86(2), pp. 276-284.
- Whiting, D.R., Guariguata, L., Weil, C. and Shaw, J., 2011. IDF diabetes atlas: global estimates of the prevalence of diabetes for 2011 and 2030. *Diabetes research and clinical practice*, 94(3), pp.311-321.
- Whittaker, S., Hardy, G., Lewis, K. and Buchan, L., 2005. An exploration of psychological well-being with young Somali refugee and asylum-seeker women. *Clinical Child Psychology and Psychiatry*, 10(2), pp.177-196.
- Willig, C., 2013. *Introducing qualitative research in psychology*. McGraw-hill education (UK).
- World Health Organization, WHO. 2002. Obesity: Preventing and managing the global epidemic-Report of a consultation. *World Health Organization*, 89(4), p.253.
- WHO, 2014. "Prevalence of obesity, ages 18+, 2010-2014". World Health Organisation.
- WHO. 2011. *Global status report on non-communicable diseases 2010*. Geneva. WHO.
- Wilkie, A. 2015. Improve your research technique – reflexive thinking, 5 practical tips.cAvailable at: <https://www.cxpathners.co.uk/our-thinking/improve-your-research-technique-reflexive-thinking-5-practical-tips/>
- Wing, R.R., Tate, D.F., Gorin, A.A., Raynor, H.A. and Fava, J.L., 2006. A self-regulation program for maintenance of weight loss. *New England Journal of Medicine*, 355(15), pp.1563-1571.
- Woodcock, C., 2010. The listening guide for coaching: Exploring qualitative, relational, voice-centered, evidence-based methodology for coaches. *Coaching: An International Journal of Theory, Research and Practice*, 3(2), pp.144-154.
- World Health Organization (WHO). 2016. *Obesity and overweight*. Geneva: World Health Organization, 1962. Technical discussions. Solar radiation and its related

heat effect on the human organism, heat illnesses (No. EM/RC12/Tech. Disc./2).

World Health Organization. Controlling the global obesity epidemic. Available at: <http://www.who.int/nutrition/topics/obesity/en/index.html>. Last accessed September 3, 2010.

World Health Organisation, Fao, and Unu. Energy and protein requirements. Geneva: WHO, Technical Report Series 724, 1985.

World Population Review (WPR).2014. Available at: <http://worldpopulationreview.com/continents/africa-population/>

Wyse, R., Wolfenden, L., Campbell, E., Campbell, K.J., Wiggers, J., Brennan, L., Fletcher, A., Bowman, J. and Heard, T.R., 2012. A cluster randomized controlled trial of a telephone-based parent intervention to increase preschoolers' fruit and vegetable consumption. *The American journal of clinical nutrition*, 96(1), pp.102-110.

Yach D, Hawkes C, Gould CL, Hofman KJ. The global burden of chronic diseases. *J Am Med Assoc* 2004; 291: 2616. PMID: 15173153.

Yancey, A.K., Simon, P.A., McCarthy, W.J., Lightstone, A.S. and Fielding, J.E., 2006. Ethnic and sex variations in overweight self-perception: relationship to sedentariness. *Obesity*, 14(6), pp.980-988.

Yancy, W.S., Olsen, M.K., Guyton, J.R., Bakst, R.P. and Westman, E.C., 2004. A low- carbohydrate, ketogenic diet versus a low-fat diet to treat obesity and hyperlipidemia: a randomized, controlled trial. *Annals of Internal Medicine*, 140(10), pp. 769-777

Yancy Jr, W.S., Coffman, C.J., Geiselman, P.J., Kolotkin, R.L., Almirall, D., Oddone, E.Z., Mayer, S.B., Gaillard, L.A., Turner, M., Smith, V.A. and Voils, C.I., 2013. Considering patient diet preference to optimize weight loss: design considerations of a randomized trial investigating the impact of choice. *Contemporary clinical trials*, 35(1), pp.106-116.

Yakushko, O., Badiie, M., Mallory, A. and Wang, S., 2011. Insider outsider: Reflections on working with one's own communities. *Women & Therapy*, 34(3),

pp.279-292.

Yeh, M.C., Rodriguez, E., Nawaz, H., Gonzalez, M., Nakamoto, D. and Katz, D.L., 2003. Technical skills for weight loss: 2-y follow-up results of a randomized trial. *International journal of obesity*, 27(12), p.1500.

Yu-Poth, S., Zhao, G., Etherton, T., Naglak, M., Jonnalagadda, S. and Kris-Etherton, P.M., 1999. Effects of the National Cholesterol Education Program's Step I and Step II dietary intervention programs on cardiovascular disease risk factors: a meta-analysis. *The American journal of clinical nutrition*, 69(4), pp.632-646.

Yusuf, S., Reddy, S., Ôunpuu, S. and Anand, S., 2001. Global burden of cardiovascular diseases: part I: general considerations, the epidemiologic transition, risk factors, and impact of urbanization. *Circulation*, 104(22), pp.2746-2753.

Ziraba, A.K., Fotso, J.C. and Ochako, R., 2009. Overweight and obesity in urban Africa: a problem of the rich or the poor? *BMC public health*, 9(1), p.465.

Zullig, K., Ubbes, V.A., Pyle, J. and Valois, R.F., 2006. Self-reported weight perceptions, dieting behavior, and breakfast eating among high school adolescents. *Journal of School Health*, 76(3), pp.87-92.

Appendix A: Focus Group Flyer



Pilot Focus Group on Dietary Interventions for Health Improvement

The Centre for Obesity Research and Epidemiology (CORE) at Robert Gordon University, is organising a focus group to gain insight into the dietary preferences, lifestyle practices and general health beliefs regarding weight loss among African women in Aberdeen/Aberdeenshire who are living away from their home countries.

You are invited to join a small focus group to discuss the issues above.

You are eligible to participate if

- You are an African woman,
- Aged 18 years and above,
- You think you may be carrying extra body weight.

If you are interested in taking part in this group discussion, please call the Principal Investigator, Bridget Adeboye, on 07780027158, or email her on 0914881@rgu.ac.uk or just fill out and tear off this slip and drop it in the marked box with the secretary

Name.....

Telephone number.....

Email address

Appendix B: Focus Group Consent Form



Patient Identification Number for this trial

CONSENT FORM

Title of Project: Pilot focus group on dietary interventions for health improvement among African women living away from their home country.

Principal Investigator: Bridget Adeboye

Supervisors: Dr Catherine Rolland, Dr. Giovanna Bermano, Dr. Winifred Eboh

Please
initial box

1. I confirm that I have read and understand the information sheet dated (Version) for the above pilot focus group study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.
3. I understand that relevant sections of the discussions may be reported anonymously. Anonymised data collected during the study may be accessed by members of the research team from Robert Gordon University. I give permission for these individuals to have access to my records.
4. I agree to take part in the above study.

Name of Participant

Date

Signature

I confirm that I have explained to the patient named above, the nature and purpose of the study to be undertaken.

Name of Person taking consent

Date

Signature

Appendix C: Information Sheet for focus group

Participants' information sheet

PILOT FOCUS GROUP ON DIETARY INTERVENTIONS FOR HEALTH IMPROVEMENT AMONG AFRICAN WOMEN LIVING AWAY FROM THEIR HOME COUNTRY.

You are being invited to take part in a research study. Before you decide if this is relevant to you, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish to. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part.

Thank you for reading this.

Introduction

Carrying extra weight is a well identified risk factor in the cause of many diseases such as high blood pressure, type 2 diabetes, stroke, high cholesterol and heart disease, some ethnic groups and women are at even greater risk. As black African populations migrate from a traditional agricultural environment to more industrialized societies; a shift in their eating pattern and lifestyle occurs often resulting in excess weight gain and illness.

There is currently a lack of research on dietary interventions for weight loss best suited to the African population living away from their countries of origin. It is not sufficient to assume that diets used within Western populations will meet the needs of this group.

The aim of the planned discussion group is to inform a larger study to assess the acceptability of two different dietary interventions in African women. The researcher plans to ask questions such as food preferences, lifestyle choices, activity levels, family support and factors that influence weight loss/gain. This will in turn inform us of the best approach for recruitment method to adopt and materials for a larger feasibility study.

Do I have to take part?

No. You don't have to take part unless you are willing to do so. Taking part is purely voluntary and you are free to withdraw from the study at any time, if you later have a change of mind.

If you do participate, you can be assured that the information that you provide us will be treated with confidentiality and that the study has been submitted to the Robert Gordon University Ethics Committee to ensure that the correct procedures are being followed.

What will I have to do if I take part?

If you decide to take part in this study, you will be expected to participate in a focus group discussion lasting approximately 45 to 90 minutes. This focus group would consist of about 6-12 female participants with discussions centring on: food preferences, lifestyle choices, activity levels, family support and factors that influence weight loss. You will be expected to make your own contribution when and where necessary.

The focus group discussion will be overseen by the lead researcher with a second researcher available to take notes. All discussion will be digitally recorded and later written up exactly as the discussions. The transcribed data will be given back to participants to check and confirm that they agree with it. All this information will be treated in complete confidentiality and stored away safely with access given only to the research team.

What are the possible risks of taking part?

There are no perceived risks in taking part in this study.

Are there any possible benefits?

Through the pilot focus group, the researcher intends to get an indication of preferred foods, lifestyle choices, activity levels, family support and factors that may influence weight loss. It is anticipated that the information gathered from this focus group will in turn help us with the design of a larger study.

Who is organizing the research?

The research will be organized by Robert Gordon University.

What do I do now?

Please contact Mrs Bridget O. Adeboye at 0914881@rgu.ac.uk or 01224262864

Thank you very much for your consideration in taking part in our research.

Appendix D: Focus Group Demographic Form

Pilot Study #

Pilot Focus Group Participant Demographics	
Date:	Time:
Place:	
<p>1. Which category below includes your age:</p> <ul style="list-style-type: none"> <input type="radio"/> 18 to 19 <input type="radio"/> 20 to 29 <input type="radio"/> 30 to 39 <input type="radio"/> 40 to 49 <input type="radio"/> 50 to 59 <input type="radio"/> 60 and over 	<p>2. What is the level of qualification you have achieved?</p> <ul style="list-style-type: none"> <input type="radio"/> Ordinary level or equivalent <input type="radio"/> Advanced level <input type="radio"/> Diploma <input type="radio"/> Degree <input type="radio"/> Masters <input type="radio"/> PhD <input type="radio"/> Other (please specify_____)
<p>3. Which of the following best describes your employment status?</p> <ul style="list-style-type: none"> <input type="radio"/> Employed full-time <input type="radio"/> Employed part-time <input type="radio"/> Self-employed <input type="radio"/> Unemployed <input type="radio"/> Retired <input type="radio"/> Disabled or unable to work <input type="radio"/> Other (please specify _____) 	<p>4. Which of the following best describes your ethnic origin?</p> <ul style="list-style-type: none"> <input type="radio"/> Black African (West Africa) <input type="radio"/> Black African (East Africa) <input type="radio"/> Black African (South Africa) <input type="radio"/> Black African (North Africa) Black other (please specify_____)

Appendix E: Food Diaries

WEEK 1 – DAY 1	DAY OF THE WEEK: 19.03.2014								
<h1>DAILY OVERVIEW</h1>									
Water Intake	50	50	50	50	50				
<p>Breakfast: Bran flake & semi-skimmed milk at 12:00</p> <p>Snack: Tea no sugar 3 x tablespoons of milk</p> <p>Lunch: Boiled rice & fried stew. (3 cans of skinned tomatoes in juice)</p> <p>Snack: yoghurt</p> <p>Dinner: beans & potato</p>									
Fruit & Vegetable Intake	/	/	/	/	/				
<p>How I felt during the day: little but light</p> <p>Daily exercise comment:</p>									
<p>Food Diary - High Protein Low Carbohydrate (HPLC) Group</p>									

WEEK 1 – DAY 2

DAY OF THE WEEK:

DAILY OVERVIEW

Water Intake	50	50	50	50	50					
--------------	----	----	----	----	----	--	--	--	--	--

Breakfast 1 slice of bread no butter and one boiled egg

Snack: 2 pieces of rich tea biscuits and aa cup of tea with 3 table spoon of milk no sugar.

Lunch: Garri with vegetable soup

Snack: one apple

Dinner: Spaghetti Bolognese (one bowl)

Fruit & Vegetable Intake	/	/	/	/	/					
--------------------------	---	---	---	---	---	--	--	--	--	--

How I felt during the day: Light

Daily exercise comment:

Food Diary - High Protein Low Carbohydrate (HPLC) Group

WEEK 1 – DAY 3

DAY OF THE WEEK:

DAILY OVERVIEW

Water Intake	50	50	50	50	50				
--------------	----	----	----	----	----	--	--	--	--

Breakfast: Fruit & Fibre with 3 tsp of milk

Snack: Banana

Lunch: Ham sandwich (2 slices of brown sbread)

Snack: yoghurt

Dinner: mince and tatties (1/2 bowl)

Fruit & Vegetable Intake									
--------------------------	--	--	--	--	--	--	--	--	--

How I felt during the day: Light

Daily exercise comment:

Food Diary - High Protein Low Carbohydrate (HPLC) Group

WEEK 6 – DAY 1

DAY OF THE WEEK:

DAILY OVERVIEW

Water Intake	50	50	50	50	50			
--------------	----	----	----	----	----	--	--	--

Breakfast: 2 slice of brown bread and a cup of tea

Snack: 1 banana

Lunch: ½ bowl porridge beans with unripe plantain.

Snack: Biscuit

Dinner: 3 pieces fish cake with 5 pieces of chips

Fruit & Vegetable Intake								
--------------------------	--	--	--	--	--	--	--	--

How I felt during the day: Light

Daily exercise comment:

Food Diary - High Protein Low Carbohydrate (HPLC) Group

WEEK 6 – DAY 2

DAY OF THE WEEK:

DAILY OVERVIEW

Water Intake	50	50	50	50	50			
--------------	----	----	----	----	----	--	--	--

Breakfast: one slice of toast and a cup a tea.

Snack: 1 apple

Lunch: Ham salad (one boil)

Snack: 2 pieces of biscuit

Dinner: fish pie (1 brown)

Fruit & Vegetable Intake									
--------------------------	--	--	--	--	--	--	--	--	--

How I felt during the day: Lighter

Daily exercise comment:

Food Diary - High Protein Low Carbohydrate (HPLC) Group

WEEK 6 – DAY 3

DAY OF THE WEEK:

DAILY OVERVIEW

Water Intake	50	50	50	50	50				
--------------	----	----	----	----	----	--	--	--	--

Breakfast: 2 scrambled egg with tomato

Snack: 1 apple

Lunch: ½ bowl of corned beef hash

Snack: 1 yoghurt

Dinner: 1 bowl of pasta Bolognese

Fruit & Vegetable Intake									
--------------------------	--	--	--	--	--	--	--	--	--

How I felt during the day: lighter

Daily exercise comment:

Food Diary - High Protein Low Carbohydrate (HPLC) Group

WEEK 12 – DAY 1

DAY OF THE WEEK:

DAILY OVERVIEW

Water Intake	50	50	50	50	50				
--------------	----	----	----	----	----	--	--	--	--

Breakfast: 1 piece of pancakes with a cup of tea & milk

Snack: 1 orange

Lunch: 2 slices of bread with ham

Snack: 1 jelly yoghurt

Dinner: ½ bowl of macaroni cheese

Fruit & Vegetable Intake									
--------------------------	--	--	--	--	--	--	--	--	--

How I felt during the day: lighter

Daily exercise comment:

Food Diary - High Protein Low Carbohydrate (HPLC) Group

WEEK 12 – DAY 2

DAY OF THE WEEK:

DAILY OVERVIEW

Water Intake	50	50	50	50	50			
--------------	----	----	----	----	----	--	--	--

Breakfast: ½ bowl of fruit and fibre with 3 spoons of milk

Snack: one slice of madeira cake

Lunch: vegetable soup with 1/3 cup of garri

Snack: 1 yoghurt

Dinner: porridge yam (3 pieces)

Fruit & Vegetable Intake								
--------------------------	--	--	--	--	--	--	--	--

How I felt during the day: Lighter

Daily exercise comment:

Food Diary - High Protein Low Carbohydrate (HPLC) Group

WEEK 12 – DAY 3

DAY OF THE WEEK:

DAILY OVERVIEW

Water Intake	50	50	50	50	50			
--------------	----	----	----	----	----	--	--	--

Breakfast :one bowl of bran flakes

Snack: banana

Lunch: ½ bowl of tuna with mashed potato

Snack:1 apple

Dinner: 1 bowl of sausage casserole with mashed potato

Fruit & Vegetable Intake								
--------------------------	--	--	--	--	--	--	--	--

How I felt during the day: Lighter

Daily exercise comment:

Food Diary – Calorie Deficient Diet (CDD) Group

FOOD DIARY INSTRUCTIONS

- Include as much detail as possible (e.g. Brand names; size of serving; time at which you eat; skimmed, semi-skimmed or full-fat milk)
- Include all your beverages (For tea and coffee record if you use milk or sugar and amounts; e.g. 1 teaspoon full of sugar, 3 tablespoons of milk)
- If you are cooking a meal, include the ingredients (e.g. Pasta sauce: 3 cans of skinned tomatoes in juice, 3 tablespoons of tomato paste, 2 cloves of garlic, 1 large onion fried in oil, 3 tablespoons of olive oil)
- Give details of how food was prepared (e.g. fried, grilled, boiled, steamed)
- Portion size (e.g. small, medium or large apple; if you can, weigh and record what you eat. When giving portion sizes, record if these portion are cooked or raw – e.g. rice, pasta, vegetables)
- The more details you provide us with, the easier it is for us to analyse your food diary!!!!
- Make sure that you write EVERYTHING down, we are not here to judge you but to help you!!!!

Food Diary - High Protein Low Carbohydrate (HPLC) Group

PARTICIPANT'S IDENTIFICATION NUMBER

KEEPING A FOOD DIARY - HOW TO AND WHY YOU SHOULD

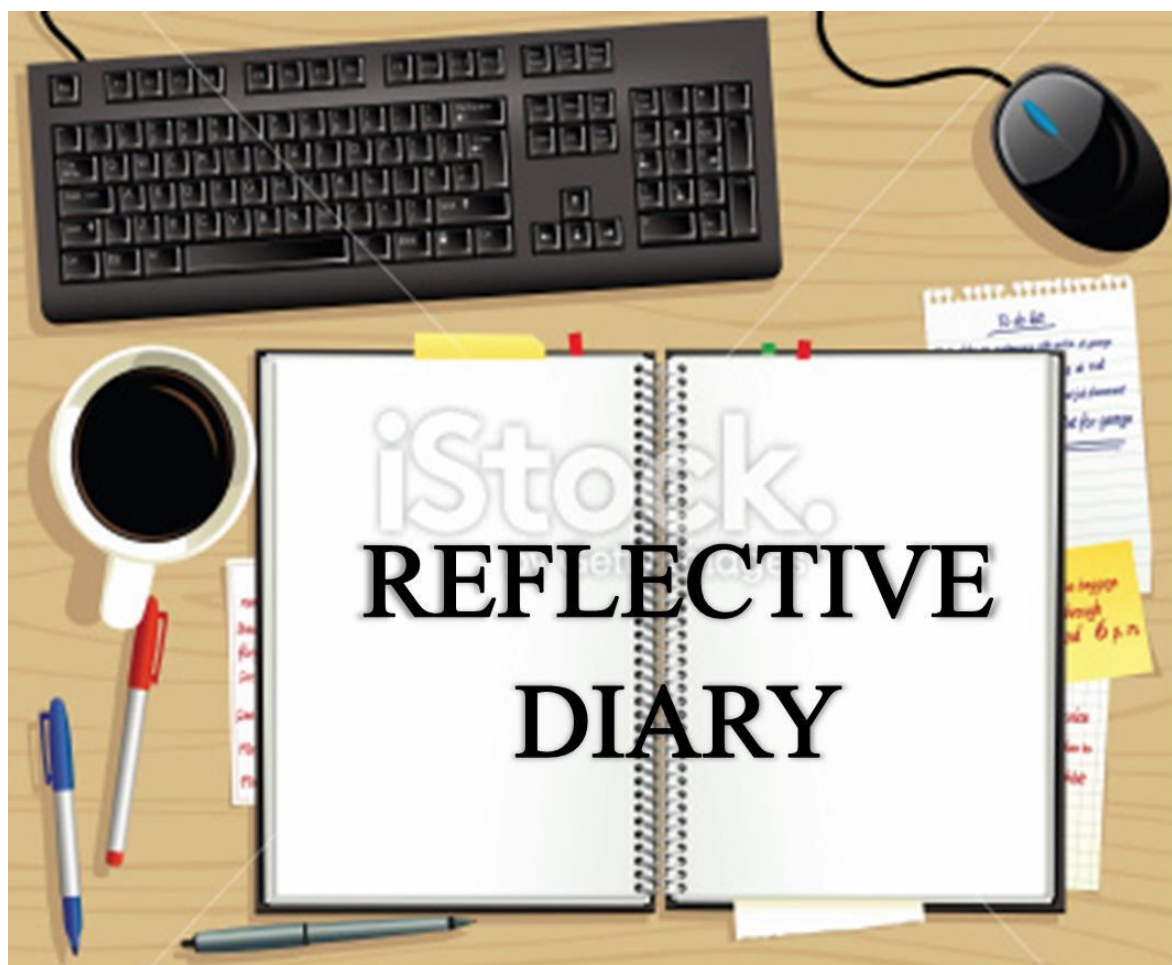
Keeping a food diary is an excellent first step to assess not only how you eat, but also why you eat the way you do. It can help you target and address any problem areas. More so, it can be of a great help to designing the eating plan that is best for you (Scott 2014).

The most important factor in keeping an effective food diary is to make it an honest one. Accuracy means recording all the food you consume including snacks, samples and tastes while you are cooking etc. Whenever you can, try to include exact portion size. Also record all beverages consumed including water intake and the amount.

For the purpose of this dietary program, you are encouraged to drink at least 2L of water daily. You will only be required to record your total food/water intake during the 1st, 6th and 11th week of the program (see guideline below). During these weeks, you are required to complete your recording electronically in the space provided, for only 3 days of the week. However, one of the days must include a weekend, for instance – Mondays, Wednesdays and Saturdays.

Food Diary - High Protein Low Carbohydrate (HPLC) Group

Appendix F: Reflective Journal Samples



Keeping a Reflective Diary

Each individual will have a different way of keeping a reflective diary. There are, however, some general points to reinforce to learners about their diary.

It should be:

- A record which is useful to you
- A cue to memory
- Honestly written
- Enjoyable to you in its production

It can be used:

- To describe key events in your practice
- To evaluate key events in your practice
- To engage in focused evaluation of recurring themes
- Reflect on what may have become habitual
- Develop and appraise action taken

Getting Started:

- Set aside time for writing
- Allow time for the sifting of thoughts and ideas
- Do not worry about style, presentation
- Remember that the aim is to facilitate reflection on practice
- Find evidence to back-up your thoughts: what evidence do I have for what I have just written?

Begin by asking:

- How do I see my role as a student on workplace placement (purposes and intentions)?
- Why did I become a student?
- What kind of practitioner do I think I am?
- What values do I believe in?
- How do I demonstrate that I am practising in a way that is consistent with relevant professional values and codes of conduct?

http://www.nottingham.ac.uk/nmp/sonet/rlos/placs/critical_reflection/pdf/allin_turnock_extra_act.pdf

REFLECTIVE DIARY

Monday:

Tuesday:

_____ WOKE UP AND HAD THIS FEELING OF EXCITEMENT. BY THE END OF THE DAY I WAS TIRED AND CRANKY BUT IN A WEIRD WAY I WAS HAPPY.

Wednesday:

_ WOKE UP WITH A SPLITTING HEADACHE BUT I FELT LIGHT AND AGILE. I TASTED MY SONS' FOOD WHEN I WAS FEEDING THEM. THIS IS MY MAIN WORRY AND CONCERN. WISH I HAD SOMEONE TO FEED THEM AND LET ME RUN AWAY FROM THE TEMPTATIONS.

REFLECTIVE DIARY



Monday:

__ I AM REALLY OPTIMISTIC THIS WEEK THAT IT WILL BE BETTER. I HAVE CONSISTENTLY BEEN DRINKING MY 2L+ OF WATER SINCE THE START OF THIS PROGRAM.

Tuesday: I HAVE BEEN TAKING MY BANANA SMOOTHIE AS BREAKFAST. ITS QUITE HANDY FOR ME AND MAKES FOR CALORIE DEFICIT. I INTRODUCED GREEN TEA THAT MAKES FOR AN ADDITIONAL IN TAKE OF WATER.

Wednesday:

_____ I WOKE UP TODAY AND FELT LIKE AM NOT MAKING ANY HEADWAY. MY WEIGHT HAS HADLY SHIFTED. AM CONSIDERING ASKING TO GO FOR THE PROTEIN ONLY DIET. CONFUSED!!!!!!!!!!!!

Thursday:

Friday:

Saturday:

NOTES (Write down ideas, suggestions or relevant issues you were not able to capture within the dates/days in your reflective journal entries):

Appendix G: Reflexive Interview Transcript

F: What does healthy eating and healthy weight mean to you?

R: For me, personally eem healthy eating I would say is when you are mindful of what you are eating and make sure that your food intake covers all the food family, carbs, protein, vegs, fruits and then balance them up, that's what I see as healthy diet or healthy eating – eating the right things in the right proportion. And then, when I talk about healthy weight, I personally have had struggles with eem eem being on the big side – from the smaller size to getting too big. So, it's a bit of personal story for me, where ee I said, okay, I've got to do something to come down because I could feel it, that my weight is too much. So, for me, healthy weight is coming down to a BMI, although as an African woman, I don't know how possible that is – it's really a big struggle for me, coming to that BMI where your Body Mass Index is between 25 and whatever eem I struggle but that's my ideal, what I will call healthy weight.

F: Just to pick up from what you mentioned, it's quite interesting – you said 'mindful of diet' in the first part of the question. So, what does mindful mean, could you expand on what you

R: For me, before I just eat but as I said, after having gone up, my weight and my BMI is so high, I am like, okay, right now I am very picky and I'm really conscious of what I put inside me. Because to me, I compare our body to the engine of a car, you know, what you put in is actually what you get. So, I am always careful like reading labels and sometimes when I want to buy burger, I ask myself – do you really need this, can't you do without it? So, I'm more conscious now, that's what I mean by being mindful.

F: You also mentioned right proportion of carbs, protein and vegs – what sort of right proportion do you mean, what you think it's the right proportion:

R: Yeah what I think, as I said, it all comes down to my personal story again

where before you just, eat, you know like in Nigeria we eat lots of rice, and then, the more you eat the more you feel you've got more, you show off what you have by what you eat. But having gone through what I've been through, personally, I just said okay, do I really ... okay, say why do you have to eat and your tummy is hurting and then you say, 'oh I've eaten too much!' And then you begin to look for laxative or something like that (chuckles), so I kinda of maybe little of carb, like carb eem, then protein; I would say 'healthy plate.' Where you have little carb, lots of veg, maybe handful of protein, dairy and little, just little of everything you know. I am changing, before, if I want carbs

- I will eat loads and then meat but now, I just like take eem I imagine the healthy plate in my head and what I would like on it.

F: QUESTION 2:

In comparison with, I'm sure this is talking about people that migrated here from their home country. So, in comparison to before you moved here, do you think you are a healthier eater or less healthy eater since you arrived in Aberdeen? Do you think you're coming to Scotland; Aberdeen has made your diet more or less healthy?

R: Eemh, I think that, basically, when I arrived here, fourteen years ago, maybe, if I have the knowledge I have now, maybe I wouldn't have eaten the way I ate. Coming from Africa, specifically Nigeria, coming to here, there is so much to eat, just so much, back home, if you want fast food - 14 years ago, you have to drive round town to go to the posh areas to look for it you know, but coming here, it's all on the high street and I really went for them, and then, the big 2L of coke, soft drinks and sugary foods, chicken drumsticks and all those stuff. Like back home, if you really want chicken, you have to buy and cut but here it is all packaged for you and I began to eat, in fact, to be truthful, I was a lot healthier when I was at home than when I came here. Maybe, it's my fault because they also have healthy options here but the surplus of unhealthy stuff and I went for it and then the escalation of

F: Let's talk about diet change there, you mentioned coming from Nigeria, I could imagine what it's like fufu, plantain and stuff like that.
You arrive here and ...

R: Yeah, again, the food we find in Nigeria, 14 years ago, here, they were not here. I remember myself and my husband driving to London to just buy Nigeria food, you know, with the stuff on the car (roof rack). And we buy a lot to last us for 6 months, 1 year. So, the availability really, the availability is not here and then what is available here, you just go for it. Most of them are, to be honest, they've got healthier ones – fruits and vegetables which to be then were more expensive; but then you could get bag of muffin for £1; so naturally, you go for the cheaper one and then you are gorging the whole thing in and it's not good for you. So, I would say I was a lot healthier back home because, yeah, availability and then if you do find it here, they are very expensive.

F: Say places like spice of Asia on John Street and stuff like that, I don't know if you know that store there.....

R: Yeah I know, they sell African foodstuff, good enough, now it's a lot easier but even then, it's never the same, you know, back home we get it fresh and sometimes you even have it behind your house you know, in the garden, you grow them – the veg. Here they are all dried, most of them. And cost as well, yeah, cost, it's very expensive – so, you wouldn't eat them as you would have loved to eat them back home and still remain healthy. So, you have to mix it all with some western food, African food, hmmh I don't know but I would say I was a lot healthier back home.

F: Yeah okay, that's kind of interesting stuff – hmm what would you say was your first impression of the kind of food you find here so much of those stuff you couldn't get or was it new to you? What is your impression of food in Aberdeen?

R: Yeah, the first impression was like, it came across to me as cheap, especially the more caloric ones like you can get cakes, muffins, scones; they are really, for me they are cheap, they are a lot and they are plenty.

I remember then I will go to Asda with a big trolley – I will fill the whole stuff and I'm like I've got the money, but you are buying the wrong things. So, the first impression is oh this people have got so much and it's in one place. So, you just go to Asda you grab as much as you can – buy one get one free, so, it's all there but later on my perception began to change, maybe because I was now feeling the impact on my health. And now when I go, I see and I have two options and maybe, I go for better ones but then, it wasn't the same.

F: So, is most of your shopping done in Asda or whereabouts do you go for shopping?

R: Now I go to Asda I go to Spice of Asia, I go to – there are few African food store on George Street but right now, main one for grocery is Asda and for African food I go to those African food store.

F: What kind of things do you think, you talked about cost and access, and what do you think the main barriers are that make you eat healthier in Aberdeen?

R: For me, it was eem really not finding the food I wanted to find and then, I think when you are talking about being healthy, it might not just be food alone because back home, I was a lot more active, you walk around a lot and you do a lot of things that exerts energy but here, you find out that, the first week I came in here it was really cold. It was in March, so I was just indoors and then you dread going out because of the weather and then you can't really – it's not safe for you to be – I won't say safe but you find out that you sit a lot at home instead of going out and exerting the energy or burning what you eat. Those for me were really huge barrier you know, where I became very sedentary, sit at home, watch TV and then the weather is cold. You give all the excuses, then the children, you got to do school runs and then you think, okay I have a licence to be unhealthy and then the food not being there and then the food being expensive. But for me, maybe if I found them then, I may not have considered cost so much, cost will come as second rather not being available. Because back home, you just go to the open market and you see healthy, fruits and vegetables are fresh, they are not preserved, you

know, they are there but here Hmh, it really made it difficult.

F: At the edge of Lagos and Abuja, I saw there was a market (R: Have you been to Lagos? F: I miss home, when I go I just eat fruits as if I should put it in a corner here before coming to Aberdeen, very cheap). **You talked about barriers, what then – what sort of things would have made it helpful to eating healthy in Aberdeen? Is there anything in Aberdeen that makes it helpful to be healthy in Aberdeen?**

R: The knowledge I have now, I would say, because maybe I was eating at home because they were available but right now, back home when I went back, fourteen years later there are lots of fast food everywhere. So we are actually getting very westernized and many people are going for the fast food. The change is so much, so apparently if I were home now – without the knowledge I have here, I would have been going for such food like McDonald and such like, you understand. So, my being here you know, it's kind of 'you've been down there with your weight very high, now your eyes are opened and the implications to your health, that makes it helpful for me. What else should have made it helpful for me. I don't know but the knowledge, the awareness of obesity and the impact because back at home some people still feel that 'fat is beautiful.' So, perhaps if I was still at home, maybe I would have been thinking that way, but it's changing too.

F: It's quite interesting and there is a question emerging as you said that. **You talked about cultural notion of what healthy is; do you find any differences between sort of like images of beauty in Aberdeen and maybe Nigerian images of beauty; what an ideal female figure should be.**

R: Yeah, coming from home, although I said its changing. I remember I just spoke with my brother this morning and he said, 'what have you eaten this morning?' I was like, don't worry about me, I am more worried about what I have not eaten than what I should eat. I know what to eat, don't worry about me. I said don't worry because I am still trying to go down. He said, "I don't want to see you so skinny and you look like stick. "When I see you, I don't want to see bony face, you don't just feel healthy, you

have to look healthy.” To him, my being healthier is looking bigger you know. Back home it’s common where we feel, if you husband has money, it should show on you. But when I came here, it’s the opposite, people are really wanting to be skinny, really really skinny and is admired but back home, hmmh....

F: How does this play out in your feelings of being healthy in this place, you are trying to

R: For me as an individual, personally, I would like to be in the middle where I am, as I said, I don’t know about this BMI thing, if I get to my normal BMI range, I may actually look a lot lot more skinnier. I just want to feel good inside me and confident, I wouldn’t go for ‘oh I would like to look like this person or that person. I just want to feel good, run up my stairs and down without panting or struggling. I know when I feel good, for me, that would be my ideal rather than how I look, how I look will come as a secondary thing but coming from home, even when you have some flesh, it doesn’t really mean so much. You are not under pressure, you are not under undue pressure to lose weight but here, the westerners, I think many people, with the media all portraying the skinnier the more beautiful but back at home I don’t know it’s the same, although it’s changing – many of the younger ones are wanting to be skinnier. So, yeah, it’s a big eye opener here, if I knew what I know now 14 years ago, maybe I would have managed my weight better.

F: Let’s talk about food – what is your favourite food or something you eat in the house, what kind of main thing....

R: I would say it used to be, because now, as I said, maybe my knowledge is affecting me but as I said before, I would go for rice, rice rice rice. You fry it, you boil it, you – all sort rice, then, beans – you use it to make moi moi, do you know (F: Yes I know), oh you know so much about Nigeria. And then emm, you know our normal pounded yam and garri made from cassava, those were things I was eating a lot and they are carb based. Everything carb carb carb, no escape, so but for now I think

I'm more of a veg person, from personal experience, I now go for vegetables, lettuce, cucumber, avocado, all those vegetables – broccoli, cauliflower, all those vegetables which is tasteless but can make do with them, maybe because I am becoming a bit more conscious but before my favourite is rice, eba that's garri and pounded yam, I could eat them a lot – our traditional food. It's quite amazing because some of the ones we use here like pounded yam is in powdered form, you can't really know whether they are yam, so, they've all been processed and it's not fresh.

F: So, when it comes like household eating, do you eat together as a family and what's your typical eating scenario. What happens, do you eat together, do you go for the TV, do you eat with the kids, I want to know what typically happens.

R: Everybody have their own program, my husband leaves early for work, then the children to school, I tried to make them eat and then go to school, he is not a breakfast person but I try as much as possible for us to eat in the evening together because that's when everybody is home. We eat together in the evening, but I must say, confess that sometimes, we eat in front of the TV, we make sure the kids are, but mostly during the weekend, we all sit on the table but my husband sees eating time, dinner as the time to catch up with the news. So sometimes he will just sit in front of the TV or turn the TV around to face the dining, then, but again, when you are sitting there in front of the TV, you are eating and watching, you don't really know how much you are eating, sometimes you finish eating and your tummy is hurting because you have eaten more than you should have eaten. So, I'm still trying to see, but his work ethics and mine, we can't eat breakfast together, he doesn't even eat breakfast and he is not there during lunch, so it's usually during the evening.

F: Let's talk about children there, I was just thinking, what sort of ideas do they have about food now; have they become western orientation, Aberdeen orientation toward food or do they still, if you cook Nigeria....

R: Once you start making Nigeria food, they start crying, it's just Aberdeen, westernized – pasta, you know, just western based, they won't eat eba,

but rice, a bit of struggle because our first daughter was just 2 when we came, the second was 1 and the rest were born here. I have four of them thankfully and yeah, they are more like European food but I still sometime insist because I know some of our food like beans is healthy and the vegetables I insist which I don't know if it's the right thing to do but I know it will help them because when we finally go home, they will be faced with that reality of eating African foods, at least some of the time. So, I insist they eat it and my husband says, 'if you cook and they don't want it, no other cooking,' sometimes they end up eating cornflakes.

F: Do you sometimes prepare separate meals or do you just go, 'bam that is it!'

R: I and my husband eat lots of you know, you just have to be considerate, they should be a compromise, and you know they didn't grow up at home. My husband will not eat pasta for any reason, he will not eat spaghetti, you just think it's children food, so sometimes, I could just make a different meal for him and then something else for the kids but that's it – some of the times, not all the times, like if I make food that I think they should eat it, everybody should eat it, we would come to a compromise.

F: Okay, what sorts of changes would you make to your family's diet? What sorts of changes would you do to your family diet?

R: Emm if I am to make changes, which already I have started making although they don't stick to the rules especially now that I am here; when we moved to Russia, I told them because when we moved to the Island, it is a totally different ball game. Here you guys have really healthy food because the sugar content of what they are bringing to the Island is so high and they can't get juice like Tropicana, which although has some sugar contents but at least they tell us they are freshly pressed. The ones in the Island is so sugary, so I made a rule – no fruit juice here and then I came to a compromise that I can juice for them, so I started juicing for the family, although it's so much work but then I feel, I just feel it, you feel fresh, you feel like you are taking life in instead of poison. You know I could feel it, since I started juicing the whole family actually like the

fresh juice but again, it's very expensive to juice in the Island because they import everything. So, these are changes and other changes I would have love to make is to cut down on the amount of cereal they take because cereal also have lots of sugar content and I would like them to eat more fruits and vegetables than eem, I think that's it. Just eating more healthier but again, I don't know but it's difficult really because I wish we could have what we have at home home where you have fresh vegetables and, because sometimes I eat their fruits in the Island it tasking a bit like chemicals; so I had to peel like the apples to minimize the impact of the insecticides. So, those are changes I would like to make, that everybody comes to the table and then my healthy plate is everybody's healthy plate, and not that people are eating junk, now that I am away, everybody is happy, then when I go back, I stick to the rules again.

F: What do you think will make those changes difficult; what barriers would they be in place to make those changes...

R: Emmh, difficult as I said, I don't know but I keep going back to it – it's being available and the support from the family too, because you just have to work together, if I make a rule and I don't get support from my husband, it will make a mess of everything, so it has to be, like if I say, 'no fruit juice, processed fruit juice in house' he has to stand with me because the kids cannot buy it one their own. If he buys it, then my rules, it shouldn't be called rules because it is for the good of the family, so I think support from significant others around you makes these things a lot easier – support and when you don't get that support, it's very difficult.

F: Yeah yeah supports are big things. Talking about change, what might prompt you to make a change...?

R: My health my health my health! You know, you know you come up to a point in your life you become very conscious of your health. You were a lot younger and then you were full of energy and suddenly climbing the stairs becomes a struggle; not like you are really dying but you know you are slower, you are not 70, you are not 80; so something tells you there

is something wrong here; I think I'm carrying more weight than I ought to carry. For me also, I think I have had like personal issues about health – like I have, I think the planter fasciitis, where I have pain under my feet; and put it down to, I put it down to weight because I've tried other solution you know like the shoe support, the jelly one whatever and then it's not going away. And they are suggesting surgery and I said no, it should be my very last resort, I will try lifestyle change; and then I decided to lose weight. So those were alarm bells. I haven't got problems with high blood pressure which I know is also part of carrying too much weight; I haven't got that problem – I thank God but you know, having this pain in the morning you know, you get up, you can't put your feet down and once I lost a bit of weight, it went away. So, I think my health first; then what others think about me. It is a bit different here, here we are a bit diplomatic when we talk to people, back home – no! I just went home this summer, and somebody told me, 'oh you are so fat.' He probably thought it was a compliment but it just like brought down, not my self-esteem but I just went, 'oh is that what they think about me?' So, what others think about you, 'you are too big, you are too this, you know it made me say, 'okay, by the time this person sees me next time, he will not say this about me.' Because it robs off your confidence, you know, although they don't mean evil, to some of them, being fat is that you are looking good. But do you really want to be referred to as being fat? So, first my health and secondly, maybe how others view me, yeah yeah. And I think that's it. The health I think, feeling good inside me is all part of my health, because it's psychological health, emotional health, physical health – not wanting to have all these comorbidities.

F: Final question here – if you are to take part in sort of dietary intervention, like go on a program to improve your diet, what way would you like to be monitored, how would you want to get some sort of feedback?

What will help, what will be good for you?

R: For me I will say I like hands on; I will say okay, if you communicate with

me by email and all that but I know I might not be as accountable as I would have been if I was seeing a therapist, if I was seeing a nutritionist which I know every two weeks I will give account to, so I will prefer to be monitored face to face. But again, the challenges of children, it depends on how often but I think if you follow me up electronically, unless you really push me and then maybe once in a while see me face to face; I don't know whether I will have the will power – maybe I will see both, electronically but you should see me at a point, fairly frequently, because knowing that I will see you will keep me on my feet and that accountability will be there. So, I will go for face to face, yeah but I wouldn't want it every week because I may not afford the time.

F: I think that's all we have talked about, is there anything you would like to add before we conclude the interview? Is there anything you would like to say or go back and clarify? Any question you think you might want to be asked or is there anything....

R: Eem, nothing really but you know, I picked interest when you were saying something about the documentary; the community is growing and possibly some things would have changed and will still change. I talked about how 'fat is beautiful' but I'm seeing the newer generation changing, I've got teenage girls and our second daughter is so tiny that we think she is almost underweight but she jogs like every night because she wants to keep her weight down and I am like, what are you keeping down? So, I think it the impact of the media and it is getting globalised that people are learning the impact of obesity or I don't know but it will be nice to find out from this population whether that perception is changing.

CHECKLIST

- ❖ Check carbohydrate content
- ❖ Check carbohydrate content per serving
- ❖ Check number of servings per pack
- ❖ Check portion size
- ❖ Check if water has been added to food and whether label applies to the food with the water added.

CARBOHYDRATE VALUES OF COMMON FOODS

		CHO
15g	Cheese Spread	1g
20g	Processed Cheese	1g
30g	Packet of Crips	15g
25g	Peanuts	2g
130g	½ Avocado	2g
22g	2 Poppadoms	9g
150g	Low calorie / Natural Yoghurt	10g

Notes:

LABEL READING ON PSMF

If you are using any food from a packet, tin, bottle or jar, check the label for carbohydrate (CHO) content.

To work out the carbohydrate content, calculate:

EITHER

(1) The carbohydrate content per serving

OR

(2) The carbohydrate content per weight of portion size.

Nutrient	Per 110g serving	Per 100g
Energy	106 kcal 442kJ	96kcal 402kJ
Protein	1.9g	1.7g
CARBOHYDRATE	9.1g	8.3g
Of which sugars	6.1g	5.5g
Fat	6.7g	6.1g
Of which saturates	4.8g	4.4g
Fibre	0.8g	0.7g
Sodium	0.3g	0.3g
Pack contains 4 servings of 110g		



IF THE LABEL ONLY SHOWS THE INGREDIENTS PER 100G Then weigh your usual portion and work out the carbohydrate content. Eg. If a portion is 30g and the carbohydrate per 100g is 10g then:

$$\frac{10\text{g CHO} \times 30\text{g}}{100\text{g}} = 3\text{g carbohydrate per portion}$$

10G CHO EXCHANGE

Breakfast Cereal

	Measure
All Bran / Bran Flakes	5 Tablespoons (20g)
Cornflakes	5 Tablespoons (10g)
Weetabix	1 Biscuit (15g)
Porridge	7 Tablespoons (120g)
Shredded Wheat	2/3 Biscuit (10g)
Rice Krispies	6 Tablespoons (10g)
Muesli (unsweetened)	2 Tablespoons (15g)

Beans

Baked	5 Tablespoons (75g)
Dried	2 Tablespoons (20g)

Nuts

Almonds	240g
Brazils	240g
Chestnuts	30g
Peanuts (shelled)	120g
Walnuts	210g

Please note – 1oz is taken as 25g

Crispbreads

	No.
Cracker bread	2
Ryvita (not multigrain or current crunch)	2
Dutch Crispbread	2
Cream Crackers	1
Carr's Table Water	2
Choice Grain	4
Tuc Biscuits	2
Cheddars	3
Oatcakes (will depend on size-check label)	5

QUESTIONS

HOW QUICKLY WILL I LOSE WEIGHT?

You may lose several kilos quickly at first. Much of this is fluid and you will notice that you pass more urine. After the first weight loss aim for 3kgs (1/3stone) every 3 weeks. You may have times when weight loss is faster or slower.

ARE THERE ANY SIDE EFFECTS?

For the first 7 – 10 days, you may have headaches, palpitations or feel light headed. If you have palpitations for the first time or if palpitations worsen see your doctor.

WILL I BE CONSTIPATED?

You may have fewer bowel motions than before. It is quite normal to have only three bowel movements in a week. You are not constipated if you are not straining. If you think you are constipated increase your daily fluid intake to at least 4 pints a day and try to walk or swim daily. Do not take laxatives unless they are recommended or prescribed by your doctor.

WHAT ABOUT MANUFACTURED FOODS?

If you are taking manufactured foods, check the label, any carbohydrate present must be added in with your daily allowance.

GRAVY?

Flour or corn flour can be used. 1 tablespoon of each will provide 10g of carbohydrate.

ALCOHOL?

It is recommended that you do not exceed the limit of 21 units / week for men, 14 units/week for women, and that you have 1 or 2 alcohol free days per week. A unit is 25ml (2TBLS) spirits, or 125ml wine. Dry red or white wine or spirits with diet mixer are allowed.

BEER, CIDER, LIQUEURS, ALCOPOPS AND SWEET WINES SHOULD NOT BE TAKEN.

COOKING HINTS

SOUPS

Make soups that contain meat and vegetables from 'Unlimited List.' Clear soup can be made with stock cubes. Broth mix, lentils and split peas cannot be used as they contain too much carbohydrate. You can add potatoes but you must take the amount of carbohydrate into consideration. If you have a freezer, make a pot of soup and freeze in individual portions.

HERBS AND SPICES

Using different herbs and spices will add variety and flavour to your meals eg. garlic, parsley, basil, chives. Be adventurous!

LEMON JUICE

A few drops of lemon juice in water, soda water or mineral water is refreshing.

SALAD DRESSING

Home made Vinaigrette dressing can be added to salads. Always check labels of bottled dressings to check for carbohydrate.

VINAIGRETTE

1tbsp. Olive oil

1tbsp. Vinegar

1tbsp. Water

Salt, pepper, herbs and spices to taste. Mix in a jug and pour over salad. Add a drop of artificial sweetener if too sour.

MENU IDEAS

Remember to keep to a total of 40g of carbohydrate and drink **at least 2 litres/4pints of fluid each day.**

SEE RECIPE BOOKLET

Breakfast (suggestions)

Bacon, egg and mushrooms	No CHO
Porridge, 4oz	10g CHO
Fruit and 1 slice of toast	20g CHO
Scrambled eggs	No CHO
Cheese on toast	10g CHO
Grapefruit, 8oz	5g CHO
Cottage cheese, 2oz; Melon, 8oz	10g CHO

Light Meals (suggestions)

Cold meat, 1 slice of bread, unlimited veg	10g CHO
Tuna and scrambled eggs	No CHO
Chicken and broccoli soup, 1 slice of bread	14g CHO
Meat roll-ups with spicy cottage cheese	2g CHO
Mackerel pate with celery sticks	1g CHO
Chicken and mushroom soup	3g CHO
Bacon open sandwich, 1 slice of bread	10g CHO

Main Meals (suggestions)

Omelette Pizza	6g CHO
Stir fried pork with vegetables	5g CHO
Bacon and vegetable chilli	10g CHO
Fish and mushroom crust	3g CHO
Turkey and ham kebabs	3g CHO
Gammon steak and vegetables	5g CHO
Steak, vegetables with melted cheese	5g CHO

VEGETABLES

The following quantities of fruit will give 5g of carbohydrate.

300g/12oz

Asparagus
Broccoli (raw)
Cauliflower (boiled)
Courgette
Cucumber
Fennel
Lettuce
Spinach (raw)
Spring Greens

UNLIMITED

Broccoli (boiled)
Celery
Kale
Mushrooms
Mustard / Cress
Spinach (boiled)
Watercress

200g/8oz

Aubergine
Baby Corn
Cabbage (boiled)
Cauliflower (raw)
Chicory
Gherkins (pickled)
Green Peppers
Leeks
Marrow
Okra
Spring Onions
Swede/ Turnip (boiled)

100g/4oz

Beansprouts
Beetroot (pickled)
Brussel Sprouts
Cabbage (raw)
Carrots (cooked)
Green Beans
Mangetout
Onions (boiled)
Tomato (raw)
Tomato (canned)
Turnip / Swede (raw)

Boiled Beetroot, Peas, Sweetcorn, Raw Carrots, Raw Onions, Mixed Vegetables, Red/Yellow Peppers and Parsnips are high in carbohydrate and **should be avoided**.

FRUIT

The following quantities of fruit will give **10g** of carbohydrate.

100g/4oz

Apple
Cherries
Kiwi Fruit
Nectarine
Orange
Peach
Pineapple
Plums
Pear
Satsuma
Tangerine

150g/6oz

Apricots
Blackcurrant
Brambles
Raspberries
Strawberries

200g/8oz

Melon
Cherry Tomatoes
Red Currents
Cranberries

400g/1lb

Gooseberries
Grapefruit

UNLIMITED

Olives
Rhubarb (stewed with artificial sweetener)
Sugar Free Jelly

***AVOID GRAPES AND BANANAS**

GETTING STARTED

To begin, keep your choices of carbohydrate foods simple. A typical days carbohydrate allowance will be:

1/3 pt (200ml) MILK; semi-skimmed or skimmed or 150ml low calorie yoghurt.	10g
1 (25g) SLICE, small loaf, medium slice or 50g (2oz) potato (egg size) or 12g (1/2oz) 1TBLS rice (raw weight) or 12g (1/2oz) pasta (raw weight) or 25g (1oz) oats (raw weight)	10g
1 PIECE OF FRUIT – see list for weight	10g
VEGETABLE – see list for quantities	10g
DAILY TOTAL:	40g

When you become more familiar with carbohydrate sources you can then be more flexible with your choice of foods. You must always remain within the 40g carbohydrate daily limit.

A little fat may be added to food, eg. Salad dressing, cream on fruit etc. Fat reduced products may have more carbohydrate than the full fat version so always check the labels.

For the first week or so it may be helpful to stock the fridge with cold meats, cooked chicken pieces, hard boiled eggs, which can be eaten if feeling hungry.

DAILY FLUIDS

It is essential to drink at least 2 litres (4pints) of fluid to keep your kidneys working properly.

Water, mineral water, still or sparkling Tea or coffee (using milk from allowance) Oxo, Marmite, Bovril, vegemite, Diet drinks – limit to 1 litre/day.

PROTEIN SHARING MODIFIED FAST

DAILY ALLOWANCES

QUANTITIES 12 – 16oz / 300g-400g of.

LEAN MEAT – eg. beef, pork, lamb, game, chicken, turkey etc.

OR *OTHER COOKED MEATS* – eg. Corned beef, smoked sausage. (Check labels of other processed meats for carbohydrate content)

OR *FISH* – eg. Haddock, plaice, salmon, tuna, mackerel, herring etc.

OR *EGGS* – 1 egg = 2oz

OR *TOFU or QUORN* (for vegetarians only)

OR

AND 2oz (50g) *CHEESE*

CARBOHYDRATE SOURCES

Many foods contain carbohydrate as starch or sugar. These include processed foods, any food that comes in a jar, tin or bottle. Please check the labels beforehand.

Milk, milk products, bread, rice, pasta, fruit and vegetables all contain carbohydrate and have to be restricted.

Foods containing sugar, e.g. biscuits, sweets, cakes, chocolate etc. have to be avoided.

Your daily intake of carbohydrate (CHO) must be restricted to a maximum of 40g. This must be taken on a daily basis. You may not have 30g one day and 50g the next day. Having more than your daily allowance may mean that you feel hungry and not lose weight.

PROTEIN SHARING MODIFIED FAST

INTRODUCTION – This diet is high in protein and low in carbohydrate. We are using this combination of nutrients to assist you achieve reasonable weight loss. If this diet is going to work, you have to follow it very carefully.

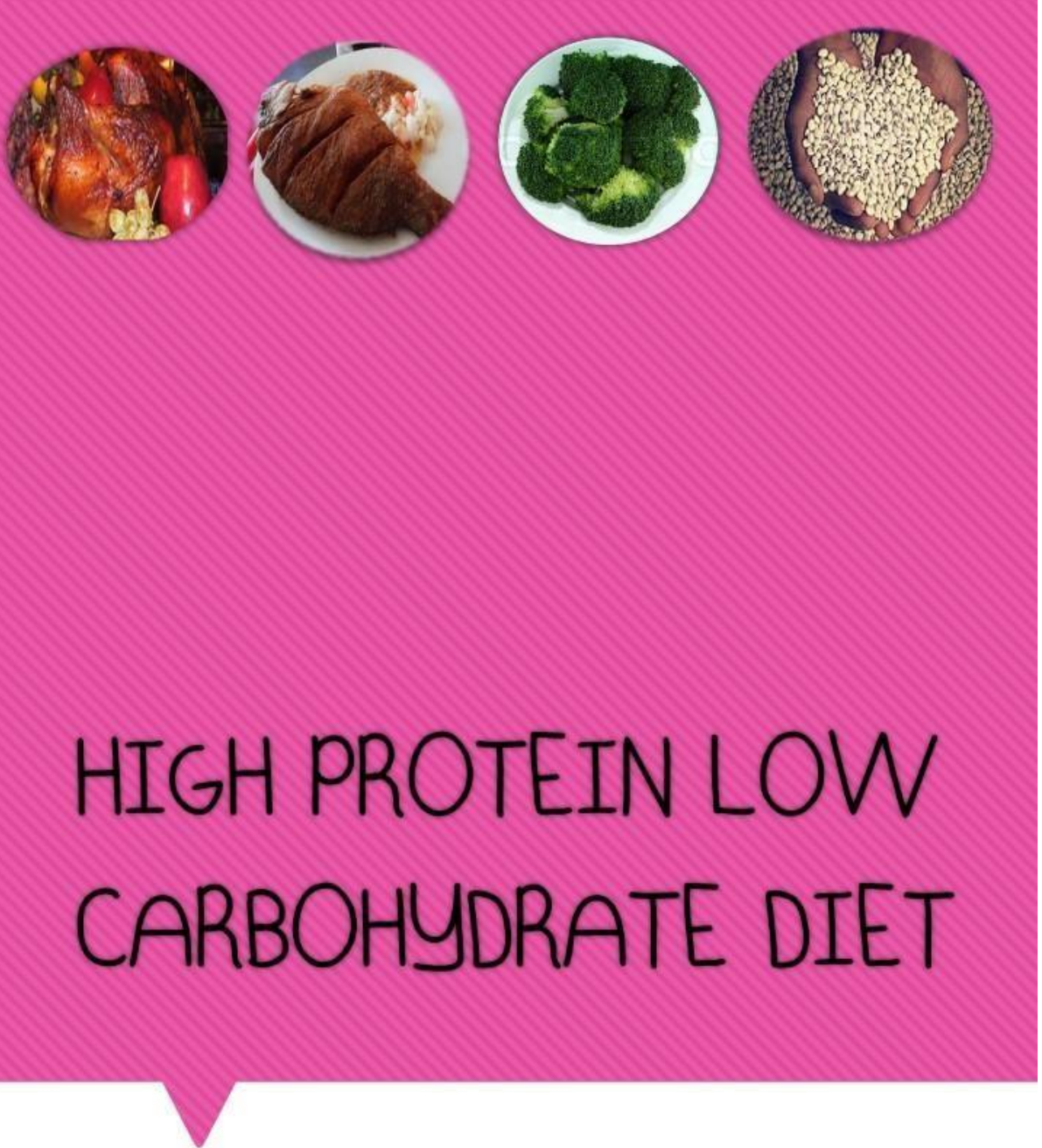
The Protein Sparing Modified Fast makes your body use its fat stores for energy. Your body can only do this well, and for the long-term, if there is less than 40g of carbohydrate (CHO), per day, in your diet.

This booklet contains suggested menu and portions of food recommended to enable you achieve your weight loss goal. It is inadvisable to give it to other people.

During the first 7 – 10 days on this diet, you will lose weight quickly. You will probably pass more urine. You may feel dizzy or light headed on standing up.

After this time your brain and body will have learned to use fat for energy provided you have followed this diet strictly. You will no longer feel dizzy and may find yourself much less hungry. Your weight loss will be slower, but you will be burning fat without losing muscle. The weight loss will continue while you stick to the diet. If you have a lapse, you will get a rapid weight gain and feel hungry.

VITAMIN & MINERAL SUPPLEMENTS – You will be given vitamin and mineral supplements, please take them as directed to keep you healthy.



HIGH PROTEIN LOW CARBOHYDRATE DIET

Dietetic Information Booklet
Protein Sparing Modified Fast (PSMF)

Adapted from Grampian University Hospital Trust (GUHT) by Bridget Adeboye (CORE)

Appendix I: Ethical Approval for Feasibility Study



School of Pharmacy and Life Sciences Research Ethics Committee

COMPLETED

17 March 2014

Student	Bridget Adeboye
Supervisor	Winifred Eboh
Graduate school	IHWR
Topic	EFFECTIVENESS & ACCEPTABILITY OF TWO DIETARY INTERVENTIONS IN AFRICAN WOMEN DIASPORA

Dear Bridget,

We have reviewed your ethics application (Title above). The panel recommends that it is of sufficient standard for you to proceed. We wish you well in your researches.

If there are any questions please do not hesitate to get in touch.

Regards

A handwritten signature in black ink, appearing to read 'Lesley Diack'.

Dr Lesley Diack
Chair of the School Ethics Review Panel

Appendix J: Ethical Approval for Post Intervention Interviews



School of Pharmacy and Life Sciences Research Ethics Committee

12 March 2015

Research Project Title	EFFECTIVENESS & ACCEPTABILITY OF TWO DIETARY INTERVENTIONS IN AFRICAN WOMEN DIASPORA
-------------------------------	--

Dear Bridget

The School Research Ethics Committee has assessed your application and the overall decision is that there are no ethical issues with your project.

I can now confirm that you are able to proceed with your research and any further ethics applications.

Should there be any amendments to this project during the research we would advise you to consult with the convener of the ethics committee as to whether a further ethical review would be required.

We wish you success with your project.

Regards

A handwritten signature in black ink that reads 'Susan Duttie'.

Convener of the School Ethics Review Panel

Appendix K: Information Sheet & Consent Form

Participants' information sheet

Post-dietary intervention Skype/telephone interview

You are invited to take part in the post-dietary intervention study. You are being asked to take part in the interview as a follow-up to your dietary intervention program.

What is the purpose of the study?

We are holding the interview to learn more about your overall experience with your dietary program. The interview will also seek to understand any barriers or benefits you may have encountered during your weight loss journey.

How will the study be conducted?

The study will be conducted in form of a telephone/Skype one-on-one interview. The interview will last approximately an hour and will be audio-recorded. A member of the team may be present during the telephone/Skype interview as an observer.

What are the possible disadvantages or risks of taking part?

There are no known risks or disadvantages of taking part, as we strive to protect your confidentiality. If you take part in the one-on-one interview, we will send you the transcript of the interview before the analysis to allow you confirm that you have not been misrepresented.

What are the possible benefits of taking part?

In taking part, you will be able to reflect on your dietary journey. You will also have the opportunity to share your experience with us which may provide useful insight that may enable a more culturally tailored weight loss intervention that will help your community.

What happens with the research study stops?

We will publish the results in academic papers and at academic conferences. Primary however, the findings of this study will be reported as part of a doctoral thesis.

Do I have to take part in this study?

Taking part in this study is optional. You can withdraw at any time without giving a reason and there will be no adverse consequences if you do so.

Will my taking part in the study be kept confidential?

Yes. We will keep the data we collect confidential, and we will not share your personal information with anyone outside the research team. Data collected will be saved on password-protected computers and stored securely in accordance with the Data Protection Act 1998.

Who is organizing the research?

The research will be organized by Robert Gordon University.

Contact details of Researcher: Mrs Bridget O. Adeboye at 0914881@rgu.ac.uk or +79140945559.

Thank you for taking the time to read this information sheet

Patient Identification Number for this trial

CONSENT FORM

Study title: Post-dietary intervention Skype/telephone interview

Principal Investigator: Bridget Adeboye

Supervisors: Dr. Winifred Eboh, Dr. Giovanna Bermano, Dr Catherine Rolland

Please
initial
box

1. I confirm that I have read and understand the information sheet dated (Version) for the above Skype/telephone interview. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.

3. I understand that relevant sections of the discussions may be reported anonymously. Anonymised data collected during the study may be accessed by members of the research team from The Robert Gordon University. I give permission for these individuals to have access to my records.

4. I agree to take part in the above study.

Name of Participant	Date	Signature

I confirm that I have explained to the patient named above, the nature and purpose of the procedures to be undertaken.

Name of Person taking consent	Date	Signature

Appendix L: Post Intervention Questions

Post-intervention interview questions and prompts:

1. **'Do you want to ask me anything before we begin?' or/and**
2. **'What made you decide to volunteer to take part in this study?'**
3. **'Tell me your overall experience whilst on the diet'**

(This is a general broad open-ended question aimed at getting the interviewee to share their experiences. If she did not readily share her dietary experiences, probing questions aimed at the topic, especially the barriers and/or benefits encountered, were asked). More specific questions were then asked to elicit further information, such as:

- o 'How did you find the diet on a day-to-day basis?'
(At this point, the interviewer expected participants to discuss possible challenges or barriers they encountered – some of which were identified in their reflective journals and food diary entries. Examples include difficulty adapting to the new diets, difficulties with calculating calorific content of African food (for the CDD group), and calculation of carbohydrate input daily allowance/limits (for HPLC group). However, if the participants gave short answers or digress from the question, the interviewer utilized appropriate prompts, using the pointers below to probe further and ask about specific challenges, for instance:
 - a. 'Tell me about your experiences using the dietetic booklet provided and calculation of carbohydrate input daily allowance/limits? (for HPLC group)
 - b. Tell me about your experience with calculating calorific content of African foods? (For CDD group)
 - c. Tell me about your experiences in following the diet that you were allocated.
 - d. How did you manage these experiences?
 - e. If you did not manage these experiences well, do you have ideas about what you could have done differently or what could have helped you do so?'

4. **In general, how would you describe your overall feelings or experience about following the diet?** (This question was to elicit positive and negative thoughts, and general feelings and opinions about the diet. It also aimed to obtain alternative views of participants who did not lose weight, as some participants

might have felt better physically even if they did not lose weight. Appropriate prompts were utilized to guide this aspect of the conversation (see Appendix....), especially if participants were generic in their responses). Depending on the response, if positive, researcher asked the flip side to the question. If negative – the researcher would then move to the next question:

5. In your opinion, what could have been changed or included in the weight loss program to improve the outcome for you?

6. Were there events or situations in your life that influenced the way you responded to the diet?

At this point, the interviewer expected participants to reply with some of the events and circumstances noted in their diaries.

7. Tell me about your experiences or how you have been doing since the dietary program ended? (This question was aimed at eliciting information on whether participants had sustained new food habits or returned to their original dietary pattern. Exploring this aspect of participants' experiences was crucial, considering that behavioral changes could play an important role in weight loss maintenance. Moreover, the rationale for extended follow-up period for the participants was to assess whether any changes in dietary-related behaviour had occurred and if so was adherence - sustained.

8. In conclusion, the interview goal was to enable the interviewer to ensure that the topics intended to be explored which was to assess the sustainability of the dietary interventions and elicit participants' experiences whilst on the dietary intervention was covered. Moreover, to allow participants to raise any issues that may be important to them which may not have been covered during the interview, the following prompt was used:

- **Is there any other issue that we have not discussed which you feel should have been addressed? Or do you want to add anything on what we have discussed?**

As the interview progressed, other probing questions were employed to elicit details where necessary, such as

–“ You mentioned.....”; “tell me more about that”; “What else occurred?” Or “– you talked about.....please describe that experience in as much detail as possible”; “–You said.... would you explain why you believe that?” Other clarifying questions were also employed such as; “can you expand a little on this?” “Can you tell me anything else?” “Can you give me some examples?” etc...

Appendix M: Letter to GP #1

Letter to GP informing him/her of patient's participation in a research study.

Bridget Adeboye O.
Centre for Obesity Research Epidemiology (CORE)
Robert Gordon University
Aberdeen
Email: b.o.adeboye@rgu.ac.uk

Dear Dr.....

I am writing to inform you about a research study being conducted by the Centre for Obesity Research Epidemiology (CORE) at Robert Gordon University which your patient had indicated interest in participating. I confirm that your patient has been given all the necessary information regarding the study and she is willing to participate.

The study is a dietary intervention geared at inducing weight loss in obese African women in diasporas. The study aims to ascertain the acceptability and effectiveness of two dietary interventions viz. High-protein/Low-carbohydrate (HPLC) and Calorie-deficit diet (CDD) amongst obese African women in diaspora. The study will involve active weight loss intervention lasting for a duration of 3 months which the participants will follow one of the dietary interventions (HPLC or CDD). During the 12 weeks active dietary intervention, participants will be followed up via email bi-weekly to discuss their diet and provision will also be made for telephone support where necessary. Participants will be encouraged to report any side effects and discomfort to the research team. The HPLC diet will also be supplemented with multivitamins and minerals in order to address the problem of potential deficiencies in participants.

We look forward to working with your patient who is interested in participating in this study. We would also inform you about your patient's progress at the completion of the dietary intervention. Please feel free to contact me or our research team with questions, using the contact information provided below.

Thank you for your time and consideration.

Sincerely,

Bridget Onyechigoziri Adeboye.

List of Research team contacts:

Dr Winifred Eboh - w.eboh@rgu.ac.uk

Dr Catherine Rolland - ext.rolland1@rgu.ac.uk

Dr Giovanna Bermano - g.bermano@rgu.ac.uk)

Appendix N: Letter to GP #2



Bridget Adeboye O.
Centre for Obesity Research Epidemiology (CORE)
School of Pharmacy and Life Sciences
Robert Gordon University
Aberdeen

Email: b.o.adeboye@rgu.ac.uk

Letter to GP informing him/her of patient's completion of the dietary intervention

Dear Dr.....

I'm writing to update you on your patient's progress re: participation on the dietary intervention research study conducted by the Centre for Obesity Research Epidemiology (CORE) at Robert Gordon University.

The dietary interventions geared at inducing weight loss in obese African women in Diasporas study sought to ascertain the acceptability and effectiveness of two dietary interventions viz. High-protein/Low-carbohydrate (HPLC) and Calorie-deficit diet (CDD) amongst obese African women in diaspora. The study involved active weight loss intervention that lasted for a duration of 3 months which your patient followed one of the dietary intervention (HPLC or CDD).

I write to inform you that your patient has completed the active stage of the dietary intervention during the month of July 2014. However, your patient will be followed up for another 12 weeks to monitor progress in sustaining any weight loss achieved during the active stage.

We look forward to working with your patient who has indicated interest to be followed up. Please feel free to contact me or our research team with questions, using the contact information provided below.

Thank you for your time and consideration.

Sincerely,

Bridget Onyechigoziri Adeboye.

List of Research team contacts:

Dr Winifred Eboh - w.eboh@rgu.ac.uk
Dr Giovanna Bermano - g.bermano@rgu.ac.uk
Dr Catherine Rolland - ext.rolland1@rgu.ac.uk

