

**A Client-Centred Weight Management Intervention for Black Women from Sub-Saharan
Africa with Overweight and Obesity in the UK**

Thesis submitted by:

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Acknowledgement

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Abstract

Obesity poses a critical public health challenge, significantly reducing life expectancy by 5–20 years and heightening the risk of common non-communicable diseases (Ataey et al., 2020; Dee et al., 2014). Globally, Black African women experience disproportionately high rates of obesity, with over 30% classified as obese (Smith et al., 2016). In the UK, the prevalence is higher among Black African women, reaching 37%, compared to other ethnic groups (HSE, 2019). These disparities arise from complex interactions between genetic, ethnic, and environmental factors, further compounded by the obesogenic nature of local environments and the effects of migration, such as dietary changes and reduced physical activity. Migrants from socio-economically disadvantaged backgrounds are especially vulnerable to obesity, facing barriers like limited participation in interventions, lack of culturally tailored programs, time constraints, and social stressors (Resnicow et al., 1999; Kumanyika, 2004).

Client-centred counselling, rooted in motivational interviewing, presents a promising approach to addressing these barriers through culturally responsive strategies (Miller & Rollnick, 2012). The socio-ecological model also highlights the importance of multi-level interventions that account for intrapersonal, social, environmental, and policy influences (Sallis & Owen, 1999). However, evidence for culturally relevant interventions targeting Black African populations in the UK remains sparse.

This PhD research aimed to develop a culturally sensitive, client-centred intervention to improve dietary behaviours and facilitate weight management among Black women from Sub-Saharan Africa with overweight and obesity in the UK. The research employed a multi-method, sequential explanatory design, integrating five empirical studies. The systematic review (Study 1) which included 22 experimental studies, revealed the effectiveness of culturally adapted, client-centred counselling delivered face to face or through hybrid modes. Studies that were grounded in theoretical underpinnings, and employed a combination of cultural adaptations, including language considerations and socio-cultural values, were more likely to achieve positive outcomes. Study 2, a quantitative study with 112 participants, focused on modifying and validating the European Prospective Investigation of Cancer (EPIC) Food Frequency Questionnaire (FFQ) for this population, ensuring its validity in capturing dietary intake. Study 3, a quantitative cross-sectional study involving 112 participants, investigated dietary patterns among Black African women in the UK revealing consumption relatively high intake of fruits and vegetables and rich in whole grains; however, they exhibit a high intake of red meat and processed foods with increased risk of many chronic diseases. Socio-demographic influences included migration status, length of stay, education and acculturation. Principal Component Analysis (PCA) identified four dietary patterns—"Western," "African Style," "Plant-Based and Sugar," and "Meat-Centric", reflecting a blend of traditional and Western eating habits.

Study 4, a qualitative study with 15 women, explored in-depth factors influencing variation in the degree of continuity and change in dietary practices among Black African immigrant women living in the UK through the use of one-on-one interviews. Four main categories were constructed with sub-categories: individual characteristics (health orientation and personal food preferences), cultural and social influences (family dynamics and cultural eating as part of identity), acculturation (adaptation of food habits, psychological impact, and shift in food

preparation responsibilities), and barriers to healthy eating (cost and availability, and work/living constraints).

Study 5 involved the development of the Black African Lifestyle and Nutrition Change for Empowerment and Development (BALANCED) a co-designed, theory- and evidence-based program addressing overweight and obesity among Black African women in the UK, using the Behaviour Change Wheel and COM-B model. The intervention targeted the primary, modifiable risk behaviours associated with overweight and obesity, specifically diet and elements of physical activity based on formative research and community input including webinar sessions with health professionals and in-depth interviews with Black African women. The BALANCED program is culturally tailored and incorporated educational modules and culturally sensitive cooking workshops designed to enhance participants' knowledge and skills in preparing healthier versions of traditional African dishes. Additionally, it emphasises on the use of client-centred counselling/motivational interviewing principles and peer support in its delivery, fostering a more collaborative and empowering approach.

The thesis emphasises the importance of tailored public health strategies, recommending culturally adapted programs informed by socio-demographic factors and dietary acculturation. The BALANCED intervention proposed in the thesis exemplifies a potential, culturally relevant solution, requiring collaboration with community leaders, flexible delivery formats, and long-term follow-up to sustain outcomes and promote health equity.

List of Abbreviations

Abbreviation	Description
ANCOVA	Analysis of Covariance
BALANCED	Black African Lifestyle and Nutrition Change for Empowerment and Development
BAME	Black Asian and Minority Ethnic
BCT	Behaviour Change Technique
BCW	Behaviour Change Wheel
BMI	Body Mass Index
BMR	Basal Metabolic Rate
CA	Cluster Analysis
CBT	Cognitive Based Therapy
CHD	Coronary Heart Disease
COM-B	Capability Opportunity Motivation- Behaviour
CVD	Cardiovascular Disease
DP	Dietary Pattern
EPIC	European Prospective Investigation of Cancer
FAO	Food and Agriculture Organisation
FBDG	Food-Based Dietary Guideline
FETA	FFQ Epic Tool for Analysis
FFQ	Food Frequency Questionnaire
FTO	Fat mass and Obesity
GDM	Gestational Diabetes Mellitus
GDPR	General Data Protection Regulation
HAES	Health at Every Size
HPFS	Health Professionals Follow-up Study
HSE	Health Survey for England
IQR	Interquartile Range
KMO	Kaiser–Meyer–Olkin
LOA	Limits of Agreement
MANCOVA	Multivariate Analysis of Covariance
MI	Motivational Interviewing
MPR	Multiple Pass Recall
MRC	Medical Research Council
MUFA	Monounsaturated fatty acid
NCDs	Non-communicable diseases
NDNS	National Diet and Nutrition Survey
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
ONS	Office for National Statistics

PAL	Physical Activity Level
PCA	Principal component analysis
PICOS	Population, Intervention, Comparison, Outcomes, Study
PIS	Participant Information Sheet
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PUFA	Polyunsaturated Fatty Acids
RCT	Randomised Controlled Trial
REI	Reported Energy Intake
ROB	Risk of Bias
ROBINS	Risk Of Bias In Non-randomized Studies - of Interventions
SCT	Social Cognitive Theory
SD	Standard Deviation
SEM	Socio-Ecological Mode
SES	Socioeconomic status
SFA	Saturated Fatty Acids
SSA	Sub-Saharan Africa
TDF	Theoretical Domains Framework
TEI	Total Energy Intake
TPB	Theory of Planned Behaviour
TTM	Transtheoretical Model
UK	United Kingdom
US	United States
WHO	World Health Organization

Thesis Outputs

This work has given rise to the following papers and presentations

Published paper

Olaoye, I., Myrissa, K., Kelaiditi, E., Tsofliou, F., & Brown, N. (2025). Effectiveness of client-centred counselling on weight management among Black African women with overweight and obesity in high-income countries: a systematic review. *Psychology & Health*, 1-32.

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Chapter 1

Chapter 1

Thesis Introduction

1.1 Overview

This PhD thesis describes the processes and studies that led to the development of a culturally adaptive client-centred intervention to address nutrition attitudes and behaviours and support weight management among Black African immigrant women with overweight and obesity residing in the United Kingdom (UK). This includes exploration of the dietary patterns and the views of these women on healthy eating and gaining insight into their perceived barriers and facilitators to following a healthy diet and lifestyle. The significance of this research is related to the health inequalities that affect Black African immigrants, who are more likely to be obese, have gestational diabetes, gestational hypertension, including severe pregnancy-related complications and death (Health Survey, 2019; Smith et al., 2016). Behavioural and lifestyle factors including healthy eating modification and increasing physical activity may improve inequities in health-related outcomes (World Health Organization (WHO), 2000). Thus, understanding Black African women's current dietary practices, and factors influencing their dietary and lifestyle behaviours can be used to inform the design of a culturally sensitive intervention and contribute to an improved understanding of effective weight management interventions in this population. Additionally, this can be used as a valuable resource to inform healthcare practice and policies targeted at this population.

1.2 Why Overweight and Obesity?

Worldwide, over 650 million people live with obesity (Ataey et al., 2020; Haththotuwa et al., 2020) and global data demonstrate that obesity is a growing problem affecting countries at all development levels (Abarca-Gómez et al., 2017; Inoue et al., 2018). Obesity remains a major public health threat and a key risk factor for Non-communicable Diseases (NCDs) (Dee et al., 2014). It is linked to a loss of 5–20 years in life expectancy and significantly increases the risk of many diseases, including hypertension, myocardial infarction, Alzheimer's disease, stroke, musculoskeletal disease, metabolic diseases (such as type 2 diabetes mellitus and fatty liver disease), depression, and some types of cancer (such as breast, ovarian, prostate, liver, kidney, and colon) (Ataey et al., 2020; Dee et al., 2014). In addition, obesity may lead to poorer quality of life, joblessness, lower productivity, and social disadvantages (Dee et al., 2014). These trends are primarily caused by significant population-level changes in the consumption of sugary beverages and less nutritious, low-density foods, as well as shifts in eating and snacking behaviours away-from home and an increase in sedentary lifestyles (Monteiro et al., 2013; Ng & Popkin, 2012; Popkin & Reardon, 2018). Moreover, the COVID-19 pandemic exacerbated negative weight-related behaviours (Pearl, 2020).

Since 1957, the prevalence of obesity has doubled globally and an estimated one-third of the world's population is overweight or obese (Ataey et al., 2020). There has been a dramatic increase in obesity rates in both men and women and across all ages, although a disproportionately higher prevalence has been observed among women (WHO, 2000). While this is a global trend, obesity rates vary across regions, countries and ethnicities (Chooi et al., 2019). The prevalence of obesity also varies considerably with socioeconomic status, with higher obesity rates among persons of lower socioeconomic status (Abarca-Gómez et al., 2017). To

illustrate, the prevalence of overweight and obesity in England's most deprived areas is 14% greater than in its least deprived parts (Health Survey for England (HSE), 2021).

In the UK, the prevalence of overweight and obesity has mirrored the global trend. The 2021 HSE found 26% of UK adults to have obesity and 38% overweight, indicating that almost two-thirds of the UK adult population have either overweight or obesity. It is also predicted that by 2040, 71% of UK adults will have overweight and obesity, roughly seven in every 10 people. When examining obesity rates by gender, the prevalence of obesity is marginally higher among women (26%) than men (25%) (HSE, 2021).

1.3 Why Black African Women?

Overweight and obesity pose significant global health challenges, and Black African women face an alarming prevalence of overweight and obesity on a global scale, with over 30% estimated to have obesity (Smith et al., 2016). Data from the UK Health Survey reveals that obesity is more prevalent among Black adults, with 71% affected compared to 64% in the general population. Among Black African individuals, women face a higher obesity risk (37%) than men (23%). This alarming trend is primarily attributed to the intricate interplay between environmental, genetic and lifestyle factors (Sarrafzadegan et al., 2014). So too, these trends underscore the substantial challenges faced in the prevention and management of obesity among these at-risk populations. Socioeconomic inequalities wield a profound influence over nutrition and physical activity patterns among Black African overweight and obese women in the UK (Francis-Devine, 2024; ONS, n.d.). Income disparities translate into varying access to and affordability of nutritious foods, with lower socioeconomic strata often grappling with constrained choices. The concept of "food deserts," areas with limited access to wholesome foods, exacerbates these challenges

(Sturm & An, 2014). Moreover, disparities in opportunities for physical activity are salient, with higher-income individuals more likely to access gyms and recreational facilities conducive to promote active lifestyles than those of lower socioeconomic status (Hansen et al., 2015). Consequently, these socio-economic disparities create an obesogenic environment, contributing to the perpetuation of health inequalities among this specific demographic.

Cultural perceptions of body image and beauty standards constitute a complex sociocultural construct that substantially influences an individual's self-concept and behaviour (Draper et al., 2016). These standards are intricately interconnected with sociocultural, historical, and psychological factors, often manifesting in distinct ideals of physical attractiveness. Among Black African women, these ideals may reflect a traditional appreciation for fuller figures. However, globalisation as well as the media have precipitated a convergence of Western beauty norms, favouring slenderness, with indigenous cultural perspectives (Jackson-Lowman, 2013). Consequently, this engenders a complex dynamic within which Black African women navigate and poses a risk for these women related to mental health issues, social discrimination as well as physical health risks (Jackson-Lowman, 2013).

The health implications of overweight and obesity in Black African women manifest as a collection of detrimental physiological and psychological outcomes (Tipre & Carson, 2022). Metabolically, these women exhibit an elevated susceptibility to type 2 diabetes, hypertension, and dyslipidaemia, underlying the cardiometabolic risks (Garcia et al., 2016). Moreover, the psychosocial impact is substantial, with elevated rates of depression and a decrease in the quality of life (Garcia et al., 2016). Equally important, Black African women often are confronted with disparities in healthcare access and outcomes, further exacerbating the deleterious effects of obesity within this demographic (Washington et al., 2023).

Despite these substantial challenges faced by Black African women in relation to being overweight and obese, there is a lack of comprehensive data on the nutritional status of Black Africans in the UK; the majority of studies originate from the United States (US). Within the health and dietary data available for ethnic minority groups in the UK, much research has been focused on African Caribbeans and South Asians (Vyas et al., 2003) with relatively little (Gibson et al., 2015; Goff et al., 2015) information on the dietary behaviours of Black Africans, despite representing 62.5% of the Black population in the UK (ONS, n.d.). Furthermore, there is very limited research on the effectiveness of weight management interventions targeted at this population.

1.4 Migration, Trends, and Health Status of Sub-Saharan Africa Immigrants

In public debate, the terms "migrant" and "immigrant" are often used interchangeably, though they carry distinct meanings. A migrant is broadly defined as anyone moving from one place to another, regardless of reason or duration, while an immigrant specifically refers to individuals entering a country for settlement (Migration Observatory, 2019). For this thesis, the term "immigrant" will be used exclusively to maintain consistency and precision. This choice reflects the focus of the study on individuals entering the UK for long-term residence and aligns with the definition provided by the Migration Observatory (2019), which defines immigrants as those requiring permission to enter or remain in a country, as well as those with an unrestricted right to do so.

The global immigrant population comprises 258 million individuals, of which 14% are from Africa. Of these approximately 36 million African immigrants, 26% now reside in Europe (Danaj et al., 2018; Flahaux & De Haas, 2016; Idemudia et al., 2020). The majority (86.8%) of

African immigrants in Europe originate from North Africa (Flahaux & De Haas, 2016). Among Sub-Saharan African (SSA) immigrants, over 70% are concentrated in four countries: the UK (1.27 million), France (980,000), Italy (370,000), and Portugal (360,000) (Idemudia et al., 2020). Migration from Africa is driven by factors such as youth unemployment, poverty, economic instability, and civil unrest (Hoovestel, 2013; Idemudia et al., 2020). The impact of immigration on host countries' health systems remains a topic of public debate. Some argue that immigration may strain healthcare systems, while others suggest the impact depends on the health status and needs of immigrants (Credé et al., 2018; Harrison & Daker-White, 2019).

However, research has demonstrated that the migration process can have a significant impact in worsening migrant's health, leading to increased vulnerability to both physical and mental health issues (Pavli & Maltezos, 2017). These influences on health can be explained in several ways. On the one hand, is the changing life contexts and circumstances, such as adaptation to new environments, loss of social support, and exposure to new stressors, can contribute to this decline (Luthra et al., 2020). Additionally, there is the argument that immigrants have healthy behaviours when they first arrive in their host country which will provide them a health advantage if they can maintain these health behaviours within their ethnic minority population (Luthra et al., 2020). This process is known as the degree of ethnic maintenance (Luthra et al., 2020). Thus, the degree of ethnic maintenance or acculturation is connected to the impact on immigrant's health. On the other hand, racism and racial discrimination, as well as an immigrant's legal status, lack of knowledge about the systems of the host country, exclusion from and ineligibility for resources that host citizens would be eligible for, all contribute to the health of immigrants (Negev et al., 2019; Phelan & Link, 2015). These factors all cause additional stressors and place immigrants in precarious situations that cause them to adopt

unhealthy coping strategies. including poor dietary habits and increased reliance on substances such as alcohol or tobacco (Negev et al., 2019).

1.5 Rationale

As outlined in the previous sections, this PhD is driven by the urgent need to address the unique challenges encountered by Black African women with overweight and obesity in the UK.

Obesity rates are disproportionately higher among Black and Minority Ethnic (BAME) groups, particularly affecting Black African women at a rate of 37%, predominantly from SSA (ONS, n.d.). These Black African women living in the UK encounter a unique set of challenges related to weight management, compounded by a complex interplay of cultural, socioeconomic, and environmental factors. In addition, there are post-migration challenges including health inequities in socioeconomic class linked to deprivation, as well as dietary practices influenced by acculturation, sociocultural factors, language barriers, accessibility to food and food beliefs and perceptions (Apekey et al., 2019; Goulão et al., 2015). Women who recently migrated alongside their older counterparts are likely to lack an understanding of the UK food-based healthy eating guidelines, which fail to take into consideration cultural and ethnic foods that people of ethnic minorities may frequently consume (Saint Hill & Madukah, 2021).

Moreover, there have been few weight management or lifestyle interventions aimed at engaging Black African women in the UK, despite the potential to enhance health outcomes for this demographic. The lack of targeted interventions underscores a significant research gap in developing culturally appropriate and effective strategies for addressing overweight and obesity in this population. This thesis seeks to address this significant research gap by developing a nutrition and lifestyle intervention tailored to the unique requirements of this target demographic. The core of this research lies in the adoption of a client-centred counselling approach, which

emphasises collaboration and personalisation in healthcare delivery. While this approach has shown efficacy in various healthcare settings (Patel et al., 2019) , its application to the unique cultural sensitivities and needs of Black African immigrant women with overweight and obesity in the UK has remained largely unexplored. Understanding dietary patterns, barriers, and facilitators to adopting healthy lifestyles will inform the implementation of a culturally adaptive intervention that can help mitigate health risks and reduce health inequalities.

1.6 Thesis Aims and Objectives

The overall aim of this thesis was to delineate the processes that resulted in the development a culturally sensitive, client-centred counselling intervention aimed at enhancing dietary behaviours and promoting weight management among Black African women with overweight and obese from Sub-Saharan Africa residing in the United Kingdom.

The programme of research had five objectives:

1. To systematically review the effectiveness of client-centred counselling weight management interventions among Black African women with overweight and obesity.
2. To modify and validate the EPIC FFQ for assessing dietary intake among Black African adults living in the UK, ensuring its relevance and accuracy in capturing dietary patterns within this population.
3. To explore the dietary patterns of Black African women with overweight and obesity from sub-Saharan Africa living in the UK.
4. To gain an in-depth understanding of the dietary choices of Black African immigrant women in the UK including the barriers and facilitators to adopting healthy diets and lifestyles.
5. To design a nutritional and lifestyle program targeting Black African women with overweight and obesity in the UK.

The relevance and potential impact of this PhD study are extensive. This research directly addresses a significant gap by developing a theory-driven intervention tailored for the target population, thereby contributing to the broader understanding of effective weight management strategies in culturally diverse groups and providing essential insights for healthcare practice and policy.

1.7 Structure of Thesis

The subsequent chapter (**Chapter 2: Literature Review**) will present an in-depth overview of the foundational context and rationale for the research undertaken in this thesis. This will draw on findings and relevant theories from various academic disciplines, including sociology, psychology, and behavioural science. The discussion encompasses significant areas such as the epidemiology of obesity, variations in obesity and health behaviours across different ethnic groups, socioecological determinants to healthy weight, and the evaluation of culturally tailored health promotion strategies alongside theories of behaviour change. Chapter 2 also offers an overall description of the study design, along with specific information of the methodologies employed, provided in the relevant chapters.

Chapter 3 presents Study 1, a systematic review aimed at evaluating the effectiveness of client-centred counselling for weight management among Black African women with overweight and obesity residing in High-Income Countries, addressing the first research objective. **Chapter 4** presents Study 2, which outlines the modification and validation of the EPIC FFQ aimed at assessing dietary intake among Black African adults in the UK. This study emphasises cultural relevance and accuracy in capturing the unique dietary patterns of this demographic, addressing the second research objective. **Chapter 5** presents Study 3, which examines the dietary patterns of Black African women with overweight and obesity from sub-Saharan Africa living in the UK.

This study provides critical insights into the nutritional status of a population disproportionately faced with significant diet-related health challenges, addressing the third research objective.

Chapter 6 presents Study 4, which expands upon Study 3 by delving deeper into the dietary choices of Black African immigrant women in the UK. This study highlights the barriers and facilitators that influence the adoption of healthy diets and lifestyles among this demographic, addressing the fourth research objective. **Chapter 7** presents Study 5, detailing the development and methodology for implementing the BALANCED (Black African Lifestyle and Nutrition Change for Empowerment and Development) intervention. This co-designed, theory- and evidence-driven nutritional and lifestyle program addresses overweight and obesity in Black African women residing in the UK. This study addresses the fifth research objective.

Finally, **Chapter 8** synthesises the findings from all five studies, providing comprehensive recommendations for future practice and research. It concludes with a set of essential statements that summarise the contributions of the thesis.

1.7.1 Thesis Study Map

Each study will begin with a thesis study map that outlines its objectives and key findings. This mapping process serves to illustrate how each study contributes to the overall structure and objectives of the thesis.

Chapter 2

Chapter 2

Literature Review

2.1 Prevalence and Epidemiology of Overweight and Obesity among Adults

Once considered a problem in high-income countries, overweight and obesity are increasing in low- and middle-income countries (Finucane et al., 2011). Obesity is a major public health problem and a global epidemic. Obesity, commonly measured by body mass index (BMI) is defined as a BMI greater than 30.0kg/m^2 and overweight between 25.0kg/m^2 and 30.0kg/m^2 (WHO, 2000). The health consequences of obesity are significant and far-reaching. Obesity increases the risk of many chronic diseases, such as heart disease, stroke, type 2 diabetes, and certain types of cancers. It can also negatively affect mental health and lead to depression and anxiety. In addition to adverse health effects, overweight and obesity also have significant economic consequences (Dee et al., 2014).

Since 1975, the global prevalence of overweight and obesity has experienced an alarming threefold increase, with a continuous exponential rise (Lin & Li, 2021; Yanovski, 2018). Several studies have provided compelling yet concerning evidence regarding the escalating rates of overweight and obesity on a global scale, indicating a clear upward trend over time. Data from prevalence studies among adults have consistently shown high and increasing rates of overweight and obesity globally. For example, a European survey (Marques et al., 2018) reported that 53.1% of adults were overweight or obese, with the highest prevalence found in Eastern Europe. Countries such as the Czech Republic (45.2%), Hungary (43.7%), and Lithuania (41.7%) had the highest rates of overweight, while Slovenia (20.8%), Estonia (19.7%), and the United Kingdom (19.2%) had the highest obesity rates. Similarly, studies in China (Chen et al.,

2019) and globally (Chooi et al., 2019) have shown similar trends of rising obesity rates, with 609 million overweight and 1.9 billion obese adults worldwide, accounting for 39% of the global population. This trend has been observed among men and women and all age groups, but with older adults and women experiencing a disproportionately higher prevalence. Although this pattern is prevalent worldwide, there are variations across regions, countries, and ethnicities, often influenced by socioeconomic status (Chen et al., 2019; Lin & Li, 2021).

In the UK, there has been a notable increase in the proportion of adults with overweight or obesity since 1993 (HSE, 2019). Obesity has increased from 53% to 64% from 1993 to 2019, and in adults from 14.9% to 28% (HSE, 2019). More recent national data from HSE project that 38% of adults in England are overweight and 26% of individuals in England have obesity, giving a total of 64% who are either overweight or obese. The prevalence of obesity is marginally higher among women (26%) compared to men (25%). Adults between the ages of 45 and 74 were more likely to be obese as figures show three-quarters of this age group are overweight or obese (HSE, 2019).

Data from national studies, including the HSE, the National Diet and Nutrition Survey and Sport England's Active Lives surveys show obesity prevalence varies substantially between ethnic groups in the UK. For example, the 2021 Survey from the Office for Health Improvement and Disparities (Raleigh & Holmes, 2021) found that adults from black ethnic groups had the highest rates of overweight and obesity (72.0%) of all ethnic groups, and significantly more than the national average of 63.5%. However, other minority groups including Asian, Chinese and mixed ethnic groups had lower percentages of adults who were overweight or obese at 57.0%, 37.5% and 59.5%, respectively. These trends are also observed when delineated by sex. Obesity prevalence is higher among women from Black African (37%), Black Caribbean (44%) and

Pakistani (33%) ethnic groups than among White British (28%), but lower in women from Chinese ethnic group (2%). In men, obesity rates are lower in Black African, Indian, Pakistani men and most markedly among Bangladeshi and Chinese ethnic groups (HSE, 2021).

Current definitions of obesity for non-White ethnic groups, are flawed. There are several problems with how obesity is measured and how thresholds are applied to minority ethnic communities in the UK (Gatineau & Mathrani, 2011). While BMI measurements have been reported to provide robust ways of defining overweight and obesity compared to measures of weight and height alone, they do not consider body composition (Saxena et al., 2004). Different ethnic groups are associated with a range of body types or shapes as well as physiological responses to fat accumulation. Thus, BMI may not necessarily be an accurate indicator of an individual's body fat or fat distribution (Gatineau & Mathrani, 2011). To illustrate, studies have shown that for the same BMI, persons of African ethnic groups appear to carry less fat than South Asian ethnic groups (Harding et al., 2008) and therefore, this could lead to underestimation or overestimation among these minority groups. A revision of BMI thresholds and waist circumference measures has been recommended by the National Institute for Health and Care Excellence (NICE) for Black and minority ethnic groups (Harding et al., 2008). Alternatively, it is recommended that generic BMI thresholds for assessing cardiometabolic risk should not be applied to all ethnicities (Deurenberg, 2001; Stegenga et al., 2014). To substantiate, Stanford et al (2019) proposes adjustments of obesity cut-offs from the standard 30kg/m² to 31kg/m² for Black women, as obesity occurs for Black women at a slightly higher BMI. However, current national obesity measurements and thresholds lack ethnically defined cut-off points; the most widely used obesity measurement classification by WHO (2010) continues to be applied to ethnically varied populations.

2.2 Inequalities in Health

In the 2021 population survey by the Office for National Statistics (ONS), 18.3% of people in England identified as an ethnic minority group (ONS, n.d.). Ethnicity is a multifaceted notion defined by characteristics such as cultural practices, common history, origins, and language (Hamer et al., 2020). It is a subjective identity that is determined by how individuals define themselves, despite being a social construct that is frequently used to identify various groups (Hamer et al., 2020). Inequalities which are the avoidable differences in income, sex, disability, sexual orientation, ethnicity, religion between groups, are often transferred into the health field.

These inequalities manifest in several ways, including disparities in health conditions (e.g., higher rates of chronic diseases in low-income groups), variations in exposure to health risks (e.g., poorer living conditions or occupational hazards), and unequal access to healthcare systems (e.g., limited availability of services for marginalized communities) (Arcaya et al., 2015).

According to studies conducted in the UK (Raleigh & Holmes, 2021), South Asian populations have a greater incidence, prevalence, and mortality from cardiovascular disease (CVD) than the White population or national average. On the other hand, Black ethnic groups in the UK have a much-reduced risk of heart disease compared to the majority of the population, despite having a high incidence of hypertension and diabetes-risk factors for heart disease (Raleigh & Holmes, 2021). Diabetes is up to six times more likely in South Asian groups than in Whites. Diabetes affects around 400,000 persons of South Asian heritage in the UK, accounting for one-fifth of the total diabetes population. This can be attributed to a combination of biological, lifestyle, and socioeconomic factors. In the same way, diabetes is three times higher among Black people than White people in the UK, and Black people also experience higher mortality rates from the disease (Raleigh & Holmes, 2021).

Health inequalities associated with obesity among adults are also present. In England, health inequalities associated with obesity vary by ethnic group, working status, disability, index of multiple deprivation decile, level of education, socioeconomic status, age, and sex (Smith et al., 2016). Research on obesity reveals that the contributing factors to weight increase are complex and vary from person to person, but they include genetic makeup, biochemical, and social factors, the latter of which is heavily impacted by health disparities (Lin & Li, 2021). A wide range of socioeconomic factors, including, education, income, housing, access to space, and the availability of unhealthy foods, influence one's ability to be physically active or eat healthily, and hence the risk of developing obesity (Arcaya et al., 2015; Lin & Li, 2021; Smith et al., 2016).

The influence

of deprivation on obesity rates is quite concerning; adults in the most deprived areas are nearly twice the prevalence of obesity compared to individuals in the least deprived regions (36% vs. 20%). Obesity and poor health are clearly influenced by socioeconomic variables such as underemployment or poverty (Arcaya et al., 2015; Smith et al., 2016).

2.2.1 Social Inequalities Associated with Health

There is compelling evidence of the effect of social inequality and population health (Arcaya et al., 2015). A gradient between social class status (typically measured by employment/occupation, education, level of income, housing type) and health status and the risk of mortality exist in all countries- whether low, middle-or high-income (World Cancer Research Fund, 2018). Health problems are more likely to occur for those whose socioeconomic status is lower. Additionally, there are systematic differences in social status present in different ethnic groups. It is crucial to

acknowledge the intersection between income and ethnicity in order to have a comprehensive understanding of health inequalities and their underlying determinants (Kurup, 2010). Ethnic minority groups, including Black Africans, are more likely to be unemployed, to live in high-deprivation areas, to experience income poverty, and to experience social exclusion (Social Exclusion, 2001). These findings highlight the need for additional research that takes these population groups into account.

In the UK, there is a significant inequality in income between different ethnic groups. The lowest median household earnings are earned by individuals from the Bangladeshi, Pakistani and Black ethnic groups, who are twice as likely to be in the bottom fifth than the national average incomes. In contrast, people from White and Indian ethnic groups earn the highest incomes (Francis-Devine, 2020). Although the reasons for this are complex, Black and ethnic minority groups are more likely to earn lower incomes due to several reasons including higher unemployment rates, higher housing costs, relatively larger household sizes and lower levels of benefits paid (Francis-Devine, 2020). All these factors have the potential to lead to health inequalities. To substantiate, in England, there is a 19-year difference in healthy life expectancy between the most and least affluent regions of the country. People in the most deprived areas, as well as some ethnic minority and inclusion health groups including vulnerable migrants, are more likely to develop multiple long-term health conditions, live longer in poor health, and die earlier than those in the least deprived areas (ONS, n.d.)

2.3 Causes of obesity

The causes of obesity are multifaceted, attributed to both genetic and environmental factors (King, 2007; Wadden et al., 2005). However, environmental rather than genetic factors are the major drivers for the ethnic differences in obesity rates in high-income countries (Maynard et al.,

2009). The following section focuses on dietary choices, physical activity levels, sedentary behaviours as causes of obesity, as these are modifiable factors that directly influence energy balance and exhibit significant ethnic differences (Maynard et al., 2019).

2.3.1 Dietary Choices

According to WHO (2020), nutritional composition has a significant role in the aetiology of obesity, type II diabetes, and coronary heart disease. An increased intake of energy-dense foods that are very high in sugars and fat and the low consumption of fruits and vegetables as well as whole grains, nuts and legumes are directly associated with overweight and obesity (Ataey et al., 2020).

Black and ethnic minority groups residing in High Income Countries (HICs) are known to be more at risk of developing non-communicable diseases with some of the health inequalities argued to be attributed to modifiable risk factors, including dietary intake and physical activity (HSE, 2021; Leung & Stanner, 2011; Liu, Wilcox, et al., 2015; Myers et al., 1995). However, there is a dearth of literature on the food choices and eating practices of minority ethnic populations due to small sample sizes and methodological challenges such as difficulties in data collection (Bennett et al., 2022). Therefore, it comes as no surprise that policies and interventions that have been informed by limited and contradictory findings have not adequately addressed the issues of obesity and healthy eating among BAMEs. To illustrate this, the National Diet and Nutrition Survey, albeit including a very small proportion of minority ethnic populations in the UK, has not been able to delineate data analysed by ethnicity (Chowbey & Harrop, 2016). Other studies have also underscored the barriers in the collection of health data from Black and Minority ethnic groups including reasons related to lack of participant engagement, lack of trust and language barriers (Ekong et al., 2022; McEwen et al., 2009).

From the handful of research which exists among the BAME population, considerable variations in dietary patterns across and within ethnic groups have been reported. For example, research by Ludwig and colleagues (2011) in the US reported that Black adults are among the poorest consumers of fruits and vegetables with low diet quality scores when compared to other ethnic groups (Ludwig et al., 2011). This is further substantiated by the National Active Lives Survey (2018), which utilised a self-reported dietary recall among participants older than 16 years in England, found that 55.9% of White British adults reported eating five portions of fruit and vegetables daily, the highest among ethnic groups. In comparison, adults from mixed-ethnic (50.7%), Asian (47.0%), and Chinese (50.3%) groups reported lower rates, all below the national average of 54.8%. Black adults had the lowest reported consumption, with only 44.2% meeting the five-a-day guideline (National Active Lives Survey, 2018). Diets rich in vegetables and fruits are known to provide a range of health benefits including the reduction in chronic diseases such as CVD, some cancers, type 2 diabetes. Additionally, such dietary patterns are associated with effective weight maintenance (WHO, 2020). According to WHO (2020) it is recommended that at least 400g of a variety of vegetables or fruits be consumed a day. In the UK, this has been translated to a minimum of five portions (80g each) of fruits and vegetables per day (NHS, 2022), with more recent arguments for 7 or 10 portions a day needed for health benefits (Aune et al., 2017).

Within minority ethnicities residing in the UK, there are examples of even further diversification. The UK's population of African-Caribbeans is a sizable, diverse community with origins in many different countries (Leung & Stanner, 2011; ONS, n.d.). People of African heritage frequently consume foods that are starchy, indigenous to Central and Western Africa, such as rice, plantains, cassava, and fufu. While plantains otherwise called green bananas, yams, and potatoes and rice

are staple foods in the Caribbean/West Indian diet (Apekey et al., 2019; Goff et al., 2015). In the same vein, South Asians consume a lot of starchy foods, fruits, vegetables, and pulses in their traditional diets, indicating that their diets are relatively rich in fibre and low in fat. However, depending on a wide range of factors, including religious beliefs, cultural practices and food availability, there exists a wide diversity in traditional foods consumed (Wyke & Landman, 1997).

2.3.2 Physical Activity Levels

Regular physical activity is proven to be protective for the treatment and prevention of non-communicable diseases such as colon cancer, type 2 diabetes, and cardiovascular disease (Lee et al., 2012; McTiernan et al., 2019; WHO, 2010). Additionally, physical activity promotes good mental health (Schuch et al., 2016), prevents dementia from developing (Livingston et al., 2017) and can help one maintain a healthy weight (WHO, 2010) and overall well-being (Das & Horton, 2012). Physical activity is any movement of the body made by the skeletal muscles that need energy expenditure (Smith et al., 2019). It can be done at different intensities as part of work, housework, transportation, leisure, or when engaging in sports or exercise. The UK physical activity guidelines recommend that adults should engage in at least 150 minutes of moderate-intensity activity, 75 minutes of vigorous activity, or a combination of the two, each week (Smith et al., 2019).

Globally, it is estimated that 27.5% of adults fail to meet (Guthold et al., 2018a) the 2010 WHO physical activity recommendations (WHO, 2010) and trend statistics indicate that there has been little progress made globally over the last ten years. The data also shows that levels of physical activity differ significantly within and between countries and regions, and that women are generally less active than males (Guthold et al., 2018b). These variations can be attributed to

several factors including unequal access to opportunities for physical activity, which exacerbates existing health inequalities. Very few studies have used objective measures of physical activity among Black and minority ethnic groups, whereas reliance on self-report measures may not provide accurate estimations (Ige-Elegbede et al., 2019). Analysis of data from the most recent national Active Lives Adult Survey reveals that South Asian, Black, and other minority ethnic group adults are the least likely to be active, while White British adults continue to have the greatest levels of physical activity; albeit below the recommended guidelines. There are also differences in the types of sport and activity people of various ethnic groups engage in. For instance, compared to all other ethnic groups, White British people are the most likely to go for leisurely walks, whereas Black people are most likely to go to the gym (National Active Lives Survey, 2018) (Active Lives, 2018). In comparison to the national average of 61.4%, the UK national survey found that Asian (50.4%), Black (55.1%), and Chinese (57.8%) populations had the lowest levels of physical activity (National Active Lives Survey, 2018). Similar to global trends, adult women in the UK engage in less physical activity than men across all ethnic groups, albeit sample sizes were too small to draw any conclusive conclusions about minority groups (National Active Lives Survey, 2018). The sociocultural, religious, language, and cultural factors (such as unsuitable dress codes and negative perceptions of exercise), as well as environmental factors (such as insufficient time, high costs of participation, and restricted access due to the lack of women-only facilities), are known barriers to physical activity faced by minority ethnic groups (Koshoedo et al., 2009).

Barriers to physical activity, particularly among Black African women, may be easily addressed in terms of education and targeted initiatives aimed at promoting physical activity (Joseph et al., 2015). These noted barriers include childcare, minimum space in one's home, not being able to

afford gym membership and inability to exercise at work, competing responsibilities, lack of understanding, motivation, fatigue, unsafe neighbourhoods time, financial constraints (Joseph et al., 2015), family and social support, laziness, work, community responsibilities, daylight and climate conditions, and the fearing of damaging ones hairstyle. Many women place joy and pride in their hairstyle. Moreover, if an African woman perspires too much, her hair becomes very hard to manage. She does not have the luxury as her other ethnic counterparts who can shampoo their hair daily (Hall et al., 2013; Henderson & Ainsworth, 2000; Price et al., 2013). However, contrasting opinions have been put forward, suggesting that some of these factors may not be barriers but excuses (Henderson & Ainsworth, 2000). For instance, women may take their children to exercise with them if childcare is not available (Barnett & Praetorius, 2015). Also, women could incorporate their children into their exercise activity. Physically active playtime activities including lifting and chasing children, are inexpensive and effective activities for mothers to stay active. These activities are not only fun and enjoyable for the child but also serve as a positive example of the importance of physical activity (Barnett & Praetorius, 2015). Thus, although some barriers mentioned here have solutions, the findings of studies such as those by Barnett & Praetorius (2015) also point to underlying barriers that are harder to resolve. In particular, the aforementioned duelling issue of needing social support to meet the challenge of changing one's lifestyle.

2.3.3 Sedentary Behaviours

Independent of moderate to vigorous physical activity levels, sedentary behaviours are also linked to higher risks of obesity (Healy et al., 2008; Owen et al., 2010). As a result of how modern technology has altered daily life, adults in the UK are becoming more and more sedentary (Dunstan et al., 2010; Woessner et al., 2021). Physical inactivity is different from

sedentary behaviour, which involves sitting or lying down while using little energy (less than 1.5 metabolic equivalents) (Tremblay et al., 2017). National guidelines recommend limiting time spent sedentary but do not specify how many hours/days of sitting might be harmful (Smith et al., 2019). While there is a limited body of research examining sedentary behaviours among adults from BAME groups, and most of the studies that do exist primarily focus on physical activity levels, some findings indicate higher levels of sedentary behaviour of Black populations when compared to their White British counterparts (Brodersen et al., 2007). Factors contributing to increased sedentary behaviour within Black and minority populations could be multifaceted, potentially influenced by cultural norms, lifestyle preferences, accessibility to recreational spaces, and socio-economic status (Brodersen et al., 2007)

2.4 Overview of Healthy Eating

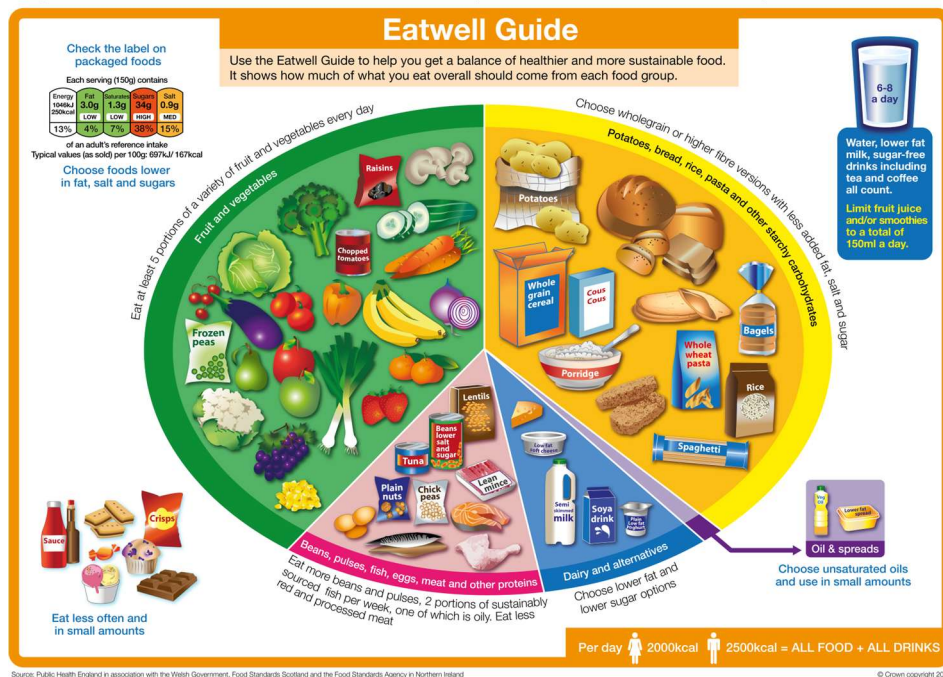
The impact of obesogenic environments highlights the crucial role of diet in preventing obesity and its associated health risks. Addressing these environmental challenges requires promoting healthy eating practices tailored to diverse populations, including Black African women, who may face unique barriers to accessing nutritious foods. According to WHO and Food and Agriculture Organisation (FAO) (Food and Agriculture Organization, 2016; WHO & Consultation, 2003), malnutrition is a condition that results from consuming diets deficient, excessive, or imbalance of energy or nutrients. Therefore, a healthy diet is one that provides all the nutrients in the proper amounts and protects against non-communicable diseases including diabetes, heart disease, stroke, and some forms of cancer in addition to protecting against all forms of malnutrition (Branscum & Sharma, 2014). Healthy diets should be diverse, well-balanced, and contain whole grains, nuts, fish, legumes, and low-fat or non-fat dairy products; they should also be high in fruits and vegetables, low in fat, sugar, and salt, and rich in

polyunsaturated fatty acids and fibre (WHO, 2019). Thus, eating healthily should entail following a diet that meets a person's energy and nutritional needs, does not impact the environment negatively, is accessible, affordable, and matches the person's cultural eating habits (WHO, 2019).

Food-based dietary guidelines (FBDGs), which have been created by the WHO and FAO since 1996 (Bechthold et al., 2018), are tailored to the food production and consumption patterns of each country and are known to promote healthy diet (Fanzo et al., 2020; Food and Agriculture Organization of the, 2016; Herforth et al., 2019). The FBDG also takes into account the nation's public health and nutrition priorities, food accessibility, dietary composition, and sociocultural impacts on diets. FBDGs are written in simple language with graphical illustrations and target a variety of conditions, including non-communicable diseases. They provide a framework for meal planning that leads to a balanced, healthful diet and for dietary advice (Fanzo et al., 2020).

Public Health England now the Office for Health Improvement in the United Kingdom developed the Eatwell guide (Office for Health Improvement, 2016), formerly referred to as "The Balance of Good Health (1994)," to offer recommendations for a healthy diet. The Eatwell guide, a policy tool used to define government recommendations on eating healthy and achieving a balanced diet (figure 2.1), includes a reference energy intake and is food-based. Along with a government-published resource that provides additional details on portion sizes of the foods, visual representations of the EATWELL Guide to assist individuals in achieving a balanced diet have been created.

Figure 2.1: The Eatwell Guide, UK (Bechthold et al., 2018)



The UK Eatwell Guide is a great resource in that it helps the UK population make informed healthier eating choices (Bechthold et al., 2018; Buttriss, 2016). It does not, however, account for the cultural and ethnic foods that people of ethnic minorities may frequently consume (Bechthold et al., 2018). People from various ethnic groups, including Black Africans may be encouraged to adopt healthy eating behaviours if the Eatwell guide was modified and made more culturally relevant (Leung & Stanner, 2011). It would also provide an opportunity to underscore certain nutritional considerations, such as highlighting some traditional diets that are typically high in sugar, salt, and fat and the need for people from Africa; with darker skin colour to take a daily vitamin D supplement throughout the year. This is further substantiated by other studies (Leung & Stanner, 2011) on the influence of awareness of healthy eating messages to modify eating behaviours of minority ethnic groups and equally important, the way they are delivered.

The Eatwell Guide has received some criticism (Bechthold et al., 2018; Harcombe, 2016). Given that the UK population continues to be more ethnically diverse, it is expected that this is mirrored in population guidelines including those pertaining to diet and nutrition. Recently, the Eatwell Guide has undergone some relevant modifications beyond simple cosmetic changes, particularly in the main plate, to better reflect current eating trends within local communities, as supported by some health organisations, groups, and individuals. In the same way, a small number of UK research studies (Ochieng et al., 2021; Saint Hill & Madukah, 2021) exploring dietary practices in ethnic minority groups have developed healthy eating guides that consider cultural requirements of the population. For example, Ochieng et al. (2021) through a participatory approach with 30 Black African immigrants in the East Midlands, co-created a healthy eating guide. The included foods were culturally specific and relevant to the Black African immigrant population (Figure 2.2). The effectiveness of this tool has not been explored, despite this substantial contribution to the field and among this demography. Furthermore, the limited methodological guidelines pertaining to the co-creation process may limit generalisation since they do not identify the specific components of the participatory technique and methodologies used.

Figure 2.2: Eatwell Guide for Black Africans (Ochieng et al. 2021)

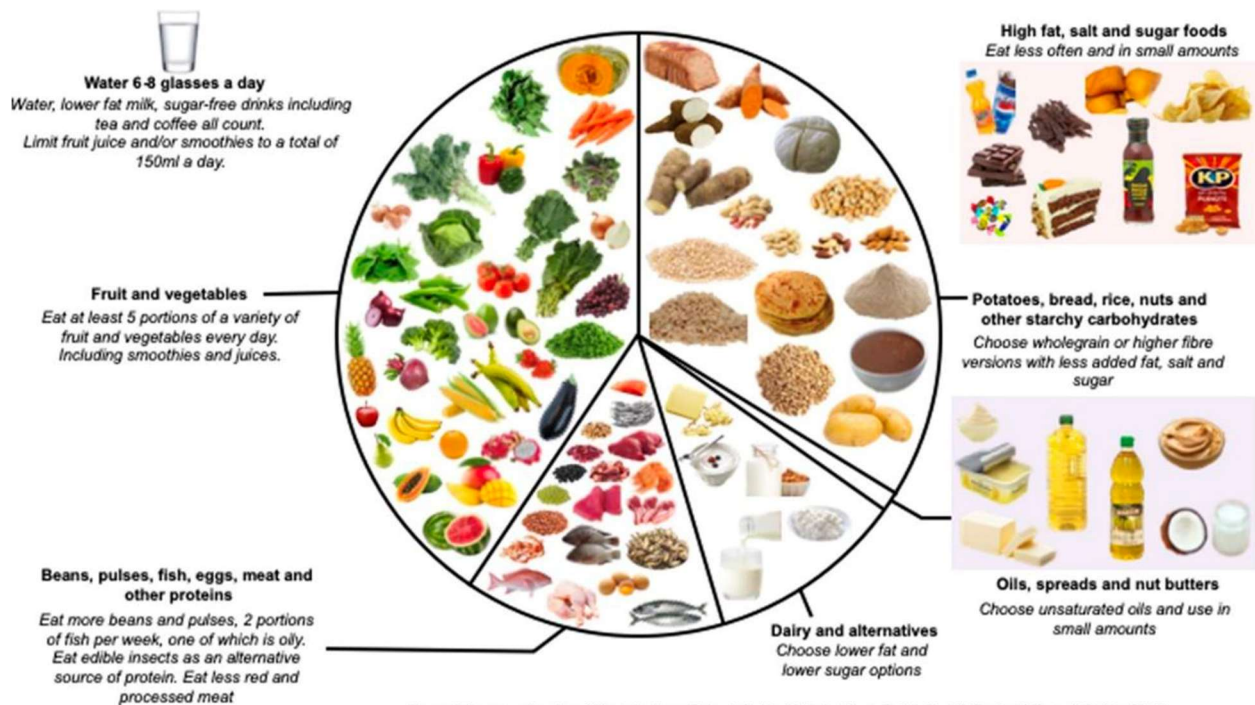


Figure 2 An example of an African-heritage Eatwell Guide (Adapted from Public Health England Eatwell Guide, 2016)

2.5 Dietary Patterns of Black African Immigrants

In developed countries, ethnic diversity is continuously increasing (Friedrich, 2015). In the European Union, the percentage of foreign-born adults was only 16% in 2013. This trend has risen, with over one-quarter of young adults on the continent now having a migrant background (Friedrich, 2015). For immigrants, integration by adjusting to new lifestyles, dietary norms and cultures may be challenging. Studies on migratory populations have revealed that moving to a new country is linked to changes in dietary and physical activity behaviours (Alyousif & Mathews, 2018; Osei-Kwasi et al., 2016, 2017; Satia, 2010). Often, migrant populations adopt the norms of their new host country, a concept known as acculturation due to a range of factors including the duration of residence, social networks formed in the host country and economic integration (Cunningham et al., 2008).

Acculturation's effects on eating behaviours may take either a positive or negative form. Findings on migrants from low- or middle-income countries (LMICs) to HICs have revealed that eating practices are typically healthier in the home country than in HICs (Goulão et al., 2015; Sanou et al., 2014).

As in other HICs such as the US, some minority ethnic groups in the UK are more likely to have nutrition-related ill health than others. As previously illustrated, compared to the general population, Black African ethnic groups are more likely to have obesity, type 2 diabetes, hypertension, and cardiovascular problems (Balfour et al., 2015; Smith et al., 2016; Tillin et al., 2013). Therefore, reliable data on the nutritional patterns and status of this target population is required for the development and implementation of effective public health interventions and dietary recommendations. In the UK, national surveys such as the National Diet and Nutrition Survey (NDNS) are regularly conducted to assess the nutritional status and dietary behaviours of the population. Data from these surveys inform public health education, interventions, and government policies in promoting health related to nutrition and the prevention of communicable diseases (Page et al., 2018). The UK NDNS which started in 1992, was designed to evaluate the dietary habits and nutritional status of both adults and children and is the sole source of high-quality data on food intake and nutritional status in a representative sample of the general population (NDNS, 2019). However, it fails to represent minority ethnic groups, as also observed in the HSE (Page et al., 2018; Sproston & Mindell, 2006). The survey utilised 24 hour recalls in determining eating habits; however, it did not include the traditional foods of minority ethnic groups. The absence of these traditional foods is primarily due to the unavailability of comprehensive and reliable data on their nutrient composition despite the increasing popularity

and contribution of ethnic foods to the UK food culture (Apekey et al., 2019; Mintel Reports, 2023).

To date, only a handful of directly comparable assessments of the dietary patterns of Black adults in the UK have taken place and these have been largely confined to people of Black Caribbean ancestry (Mennen et al., 2001; Sharma et al., 1999; Vyas et al., 2003). Studies evaluating the nutritional composition and role of traditional diets of Black African (West Africans) adults living in the UK (Gibson et al., 2015; Goff et al., 2015), reported an association between long residence and increased dietary acculturation as well as increased energy, fat, and salt intakes—nutrient profiles that are known to have negative health effects (Keys, 1970; Ravera et al., 2016). However, these studies also describe West African diets as very reliant on more traditional foods that make a significant contribution to their nutritional profile. These traditional foods include traditional ‘one-pot’ soups and stews, jollof rice as well as traditional starches such as yam, cassava and fufu. On the other hand, non-traditional foods are also prevalent in the diet of West African adults; for instance, biscuits, confectionery, breakfast cereals, processed meats and sugar-sweetened beverages; foods also reported as popularly consumed African foods in the UK (Apekey et al., 2019). Generally, these patterns (Apekey et al., 2019; Gibson et al., 2015; Goff et al., 2015) show that Black African migrant diets are characterised by significantly high intakes of fat, saturated fat and protein and significantly lower intakes of carbohydrates; macronutrient profiles that may promote an increase in the risk of NCDs and type 2 diabetes amongst Africans in the UK. Despite these noteworthy findings, their relevance is constrained by the lack of up-to-date information, leaving uncertainty about whether these dietary patterns have evolved in recent years. Furthermore, the studies face limitations with significant underreporting rate (51%), surpassing the national average of 30%.

2.6 Interventions Addressing Overweight and Obesity Among Black African Adults

As previously highlighted, weight loss reduces the risk factors for CVDs, type 2 diabetes, hypertension and dyslipidaemia and these benefits persist as long as weight loss is maintained (Stevens et al., 2001; Tuomilehto et al., 2001; Wc, 2002). There are different weight management interventions available including dietary, lifestyle, pharmacological and surgical interventions; however, behavioural interventions utilising reduced diet and increased exercise are generally more effective for weight loss (Franz et al., 2007). Short-term (4 to 6 months) behavioural interventions targeted at adults resulted in clinically significant weight loss by focusing on dietary modifications, increased physical activity and healthier lifestyle choices. A five per cent weight loss from baseline is generally regarded to be "clinically meaningful" (Blackburn, 1995; Williamson et al., 2015) and is supported by the obesity guidelines recommending 5–10% medically supervised weight loss to offer health benefits in diabetes prevention and improvements in cardiovascular disease risk factors (Jensen et al., 2014). However, weight regain is an intractable problem (Dansinger et al., 2007; Wadden et al., 2005). Weight maintenance post-intervention is one of the greatest challenges of interventions targeted at weight loss regardless of the setting or target population. This is because individuals tend to regain much of the lost weight within one year of treatment (Hill et al., 2005; Perri et al., 2004). Among Blacks, this challenge is even more pronounced. Overweight African women are less likely to consider themselves overweight than White women (Dubowitz et al., 2008; Hendley et al., 2011; Okop et al., 2016; Sivalingam et al., 2011) and are also less likely to participate in weight loss programs (Hendley et al., 2011; Murphy & Williams, 2013; Williamson, 1993). However, when they do participate in self-imposed or formal programs, they are less likely than their White counterparts to achieve weight loss (Kahn et al., 1991; Kumanyika, 2004;

Kumanyika, 2002; Murphy & Williams, 2013; Wing & Anglin, 1996) or weight-loss maintenance of over 12 months (Kumanyika et al., 1991). This racial discrepancy in behavioural weight intervention outcomes may be influenced by several factors. On the one hand, differential dietary and physical activity adherence between Black and White women in behavioural weight intervention may contribute to this. For example, in the multicentre intervention by Wadden and colleagues (2011), physical activity adherence was shown to be significantly associated with weight reduction, with self-reported physical activity being higher in White women than Black women. On the other hand, the lack of cultural adaptations in weight management programs coupled with a failure to address issues of relevance among the black population contribute to the disparities in weight intervention outcomes (Kumanyika & Ewart, 1990; Murphy & Williams, 2013).

Positive intervention effects on weight loss, weight change, and improvements in waist circumference have been documented in some studies involving Black women with overweight and obesity. However, these studies have largely been conducted in the US, highlighting a significant gap in research from other geographic locations, particularly regarding African populations. (Kennedy et al., 2005; Kiplagat et al., 2022; Lynch et al., 2014; Newton et al., 2018; Samuel-Hodge et al., 2009; Sattin et al., 2016). These interventions employed dietary/nutrition education (Lynch et al., 2014; Sattin et al., 2016) with behavioural change counselling (Kiplagat et al., 2022; Newton Jr et al., 2018; Samuel-Hodge et al., 2009; Sattin et al., 2016) and physical activity (Kiplagat et al., 2022; Lynch et al., 2014; Newton et al., 2018) with an overarching aim of promoting lifestyle modifications; healthy eating by adopting low-fat, high-fibre diets and increased fruits and vegetable consumption and an increase in overall physical activity at individual and interpersonal levels. The duration of these interventions varied between 3 to 12

months. Most of them were community and health facility-based (Kiplagat et al., 2022; Lynch et al., 2014; Sattin et al., 2016) whereas others were church-based (Kennedy et al., 2005; Newton et al., 2018). The success of these treatments could be attributed to the cultural adaptations in the interventions which included the involvement of Black interventionists, the use of the group's preferred language and the incorporation of cultural foods and relevant cultural activities and concepts into the program content. In contrast, the success of weight loss maintenance in overweight and obese Black African women has not been clearly established due to the very limited studies available in this demographic. Nonetheless, from the available studies, weight maintenance in Black women has been largely unsuccessful (Martin et al., 2008; West et al., 2007, 2019). To illustrate this, the study by Martin et al. (2012) which incorporated dietary and physical activity recommendations as well as cultural relevance, reported gradual weight regain in 64% of Black Adults who had previously achieved weight loss over an extended follow-up interval of 12-18 months. Their outcomes may have been due to limited continuous treatment contacts. Overall, the findings in these studies (Martin et al 2012; Lynch et al., 2014; Sattin et al., 2016; Samuel-Hodge et al., 2017; Kiplagat et al., 2022) are promising but not without limitations: small sample sizes, very high attrition rates and the lack of power to detect statistically significant changes.

In the UK, despite increased exposure to obesogenic environments (Department of Health, 2008) and disproportionately high rates of obesity among some ethnic groups (The NHS Information Centre, 2010), there is a paucity of studies on effective interventions targeted specifically at Black overweight and obese people (Leung & Stanner, 2011), also reflecting some of the challenges of undertaking research in this “hard to reach” sub-population (Ekong et al., 2022). Among few weight management intervention studies targeted at adults living in areas of

deprivation, the interventions aimed at increasing fruit and vegetable intake (Ashfield-Watt et al., 2007), enabling people to choose and cook healthy food (Kennedy et al., 1998; McKellar et al., 2007; Steptoe et al., 2003; Wrieden et al., 2007) and focusing on promoting Mediterranean types of diet (McKellar et al., 2007). Overall, these interventions showed evidence of mixed effectiveness on increased fruit and vegetable intake and nutrition knowledge but no significant impact on weight control.

One notable initiative addressing these gaps is the Up!Up! Programme (Lighter Living, n.d.), a culturally tailored tier 2 weight management programme developed for Lewisham's Black African and Black Caribbean residents. By offering culturally relevant counselling and community-based support, this programme reflects a deep understanding of the unique cultural and social needs of its target population. The 12-week programme consists of 12 one-hour group-based sessions. Following its pilot from April to June 2022, an evaluation of the programme from March to December 2023 showed that 46% of those who completed the programme achieved a 2% weight loss, with 25% achieving a 5% weight loss. However, its geographic limitation to Lewisham restricts its reach and prevents the dissemination of its benefits to other regions where Black African women face similar health challenges. While these results are promising, there is a clear need for more extensive evaluation to assess long-term outcomes and ensure the programme's continued effectiveness and sustainability. In contrast, mainstream weight management programs such as those offered by Weight Watchers and NHS initiatives (Weight Watchers, n.d.) provide structured support and group-based interventions but often lack the cultural specificity necessary to address the unique dietary and lifestyle factors of Black African women. Their standardised approaches may fail to resonate with culturally influenced behaviours, limiting their effectiveness within this population.

In light of these findings, it becomes crucial to recognise and address the barriers encountered by BAME groups in adopting behavioural and lifestyle interventions. Challenges such as limited knowledge, family and work obligations, costs, comprehension of health information, availability of neighbourhood resources, accessibility to group exercise, and affordability of facilities (Ige-Elegbede et al., 2019) underscore the need for a more tailored and culturally sensitive approach. Moreover, this prompts the exploration of client-centred counselling as a potentially effective intervention. While the terms "client-centred" and "person-centred" are often used interchangeably, they are conceptually distinct, with the key difference lying in their application. Both approaches recognise the importance of autonomy and the individual's capacity for self-direction; however, client-centred counselling, as developed by Carl Rogers, is characterised by a more structured and directive role for the therapist, who guides the client through the process while still emphasising the client's central role in decision-making (Rogers, 2012). In contrast, person-centred therapy tends to focus more broadly on fostering self-actualisation, often with less active involvement from the therapist (Miller & Rollnick, 2012). In the context of addressing the complex health needs of Black African women, the client-centred approach may be particularly valuable. It allows for a more targeted and responsive intervention that respects cultural differences and personal autonomy while providing necessary professional guidance to navigate the specific barriers these individuals face. This tailored approach not only aligns with the principles of self-determination but also enhances the potential for sustainable health outcomes (Miller & Rollnick, 2012; Patel et al., 2019).

2.7 Culturally Adapted Interventions for Weight Loss

Reducing health disparities is an issue of equity and social justice (Marmot, 2013), and it has been shown that BAMEs require treatments that are culturally appropriate (Kumanyika, 2002;

NICE, 2014), interventions aimed at addressing obesity should be tailored to the needs of ethnic minority populations, as "one size fits all" approaches to health promotion have been criticised (Wise, 2009).

Several frameworks have been devised to enhance the efficacy of culturally adapted strategies in behavioural interventions (Castro et al., 2010; Di Noia et al., 2013). One such model, by Resnicow et al (1999) differentiates strategies into "deep" and "surface" components. "Deep structure" refers to including components that need a deeper comprehension of a group's core cultural values, whereas "surface structure" refers to matching intervention components with the target population's observable characteristics. Alternatively, Kreuter et al. (2003) offered a framework that includes five different categories of strategies: (i) peripheral (aiming to project the appearance of cultural appropriateness, similar to surface structure); (ii) evidential (looking to contextualise the health impact for the target group); (iii) linguistic (using language to improve the accessibility of materials); (iv) constituent involvement (based on experiences or input from the target population); and (v) sociocultural (reflecting the underlying beliefs, values, and norms of a group, similar to deep structure).

Although to date, the effectiveness of public health interventions for Black populations in the UK is still largely unknown, several studies employing culturally adapted strategies have demonstrated noteworthy effects in enhancing diet and weight change outcomes among African women in the US (Kong et al., 2014). Guided by the frameworks of Resnicow et al. (1999) and Kreuter et al. (2003), these studies incorporated constituent-involving strategies during the planning and intervention delivery phases (Backman et al., 2011; Parker et al., 2010). Additionally, evidential strategies were observed, communicating disease/health risks (Babatunde et al., 2011). Linguistic strategies were implemented by adapting program materials

to accommodate participants' literacy levels (Keyserling et al., 2002; West et al., 2008).

Sociocultural strategies were often utilised to enhance intervention delivery, addressing themes such as spirituality, religiosity, faith (Djuric et al., 2009; Fitzgibbon et al., 2005), traditional and cultural foods (Auslander et al., 2002; Fitzgibbon et al., 2005; West et al., 2008), family and social support (Auslander et al., 2002; Yancey et al., 2006), and barriers, including economic and cognitive factors (Auslander et al., 2002; Kennedy et al., 2005; McNabb et al., 1997) and body image specific to African American women (Befort et al., 2008; McNabb et al., 1997; Stolley, Sharp, et al., 2009).

2.8 Behavioural Change Theories and Techniques

The effects of interventions aimed at changing health-related behaviours are typically modest, but they could be more effective if they are grounded in relevant theory (Davis et al., 2015).

Davis et al's (2015) scoping review of theories of behaviour and behavioural change identified 82 theories for public health interventions but none of them can completely explain behaviour change. Nonetheless, the use of theory, extending beyond the individual to the environment is necessary to understand barriers to behaviour change and to implement effective interventions (Sallis et al., 2015). Certain behaviour change theories have strong psychological components and heavily focus on the individual. Among these theories are the transtheoretical model (Prochaska, 1994), the health belief model and the theory of planned behaviour (Ajzen, 1985). On the contrary, other models take into account an individual's behaviour in relation to their physical, social, and cultural environments. These models include the ecological models (Sallis et al., 2015; Stokols, 1992) and the social cognitive theory (Bandura, 1986).

Bandura's (1986) social cognitive theory proposes that people are driven not by inner forces, but by external factors in motivating and shaping their thoughts, behaviours and overall

development. This model suggests that human behaviour can be explained by a triadic interaction of intrapersonal, social, and physical environmental factors. Whereas social-ecological models emphasise the influences of social systems, governmental policies, and physical surroundings and recognise that behaviour is influenced at multiple levels (Sallis et al., 2015). These levels of influence range from interpersonal factors such as demographics and cognitive functioning, the social environment, such as supportive behaviours and culture, the physical environment, such as geography and transportation, to the policy context, such as policy governing resources and infrastructure (Sallis et al., 2015).

According to Langille and Rodgers (2010), a socio-ecological approach to weight management asserts the ongoing interaction between an individual and their environment. An individual's decisions are shaped by a complex network of social and psychological processes. A change in behaviour is also dynamically facilitated and hindered by environmental and policy factors. Furthermore, an individual's behaviour can be impacted by these many influences both alone and collectively. It is proposed that multi-level interventions may have the highest ability to result in and maintain behaviour change given the wide variety of factors that interact to impact behaviour (Langille & Rodgers, 2010). All levels of the socio-ecological model must be addressed to influence behavioural modification, including facilitators and barriers to healthy behaviour. A multi-layered model of this kind has been applied previously to investigate factors influencing body size in ethnically diverse populations (Styles et al., 2007). It is regarded as a useful theoretical framework for preventing and treating obesity (Langille & Rodgers, 2010).

Behaviour change techniques (BCTs) are strategies used to help individuals change an undesirable behaviour or adopt a new desired behaviour, they are often based on psychological theories and with some evidence supporting their use (Michie et al., 2013). These techniques are

used in a variety of interventions and can vary in content, based on the specific behaviour being targeted, the target population, and the context of the intervention. Arguably the benefits of using such techniques are that they can be used as a transferrable skill by persons seeking behaviour change (Abraham & Michie, 2008). To elaborate, an individual may be taught a range of techniques to manage their weight and use these skills to improve other health-related behaviours. This versatility highlights the broader impact of behaviour change techniques, empowering individuals to take a more comprehensive approach to their overall health and well-being. Overall, understanding what techniques are most useful in promoting different health behaviours can aid in developing effective interventions (Abraham & Michie, 2008; Michie et al., 2013).

In the field of behaviour change interventions, the BCT Taxonomy, as outlined in Michie and colleagues' work (Michie et al., 2013), serves as a valuable reference. This taxonomy categorizes various techniques used in behaviour change interventions and acknowledges the diversity of techniques tailored to different behaviours. Specifically focusing on weight management, several common BCTs are frequently employed. These include Goal Setting (BCT 1.1), involving the establishment of small, manageable, and achievable aims (Dombrowski et al., 2012); Self-Monitoring (BCT 2.3), which entails keeping track of habits, such as caloric intake, energy expenditure, or triggers for unhealthy behaviours (Dombrowski et al., 2012); Problem-Solving (BCT 4.1), which involves the identification of problem situations, moods, and influences and the creation of strategies to address them (Dombrowski et al., 2012; Hartmann-Boyce et al., 2014); Social Support (BCT 3.1), encompassing group sessions, peer support, online social networks, and modelling to encourage positive behaviours (Borek et al., 2018; Hartmann-Boyce et al., 2014); and Health Education (BCT 5.1), where individuals learn about healthy behaviours,

comprehend the significance of diet and physical activity in health, and gain awareness of the health implications of excess body weight (Dombrowski et al., 2012; Hartmann-Boyce et al., 2014; Borek et al., 2018). These examples highlight the specificity and diversity of BCTs, each playing a unique role in fostering behaviour change within the context of weight management. Moreover, weight management interventions that include three or more BCTs have been proven to be more successful, indicating that weight loss is more likely to be achieved by the administration of multiple BCTs, even though it is unclear which BCTs are more effective than others (Haire-Joshu et al., 2019; Liu, Wilcox, et al., 2015; Olateju et al., 2021).

2.9 Understanding Health Behaviours

In order to understand specific health behaviours and outcomes, it is often helpful to use established frameworks. These frameworks provide structured ways to analyse the factors influencing health behaviours, ranging from individual motivations to broader societal influences (Glanz et al., 2015). Numerous frameworks are available, each with unique strengths and applications. Among these, the Social Ecological Model (SEM) and the Capability, Opportunity, Motivation and Behaviour (COM-B) model are particularly valuable in the context of this study area.

2.9.1 The Social-Ecological Model

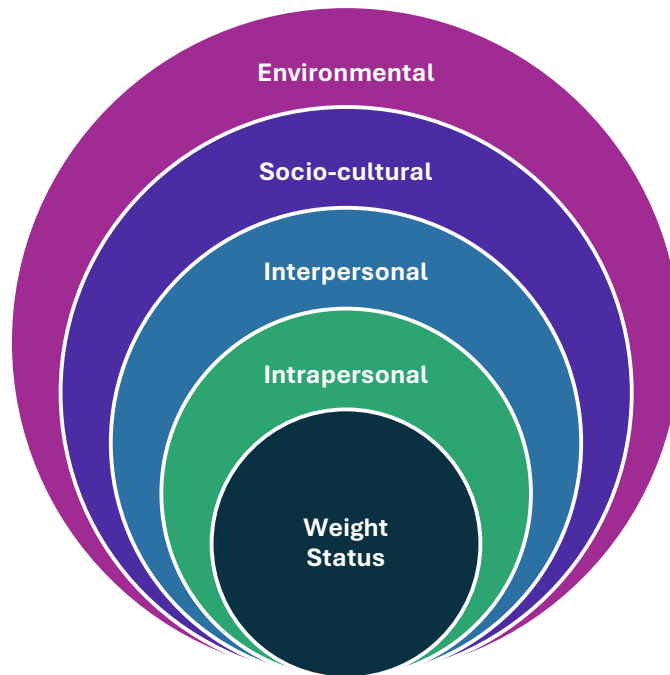
At its most basic form, a SEM is a visual representation of the ecological theory of a given health behaviour or outcome. It demonstrates how multiple factors interact to influence a person's health and wellbeing (Caperon et al., 2022). It offers a framework that is useful for gaining a better understanding of the many facilitators and barriers that have an influence on health behaviours and outcomes, in this case, adult overweight and obesity. When considering the everyday exposures that individuals experience and how they will react to each exposure, it can

be expected that no two reactions will be precisely the same (Caperon et al., 2022; Langille & Rodgers, 2010). These daily exposures encompass the array of elements and situations individuals encounter in their lives — from environmental conditions and social contexts to personal experiences. This complexity underscores the diversity in how individuals respond to their environment, their experiences and the various factors that shape their health (Caperon et al., 2022; Langille & Rodgers, 2010). The SEM aids in illustrating these exposures and starts to build a deeper comprehension of the intricate interactions between the numerous exposures that people encounter daily and their effects on how they develop health behaviours (Caperon et al., 2022). The SEM also holds great potential in addressing the broad and intricate issues of preventing overweight and obesity as well as in identifying the most effective points of intervention (Lytle, 2009).

The SEM proposes that behaviour is determined on four or five levels: intrapersonal, interpersonal, institutional, and environmental/societal (Caperon et al., 2022). It assumes that appropriate changes in the social environment will encourage behavioural improvements in individuals. Successful lifestyle behaviour change depends on understanding the socio-ecological factors that influence lifestyle behaviour in a particular target group (O'Mara-Eves et al., 2013). Thus, in order to minimise barriers and maximise facilitators to healthy eating and lifestyle modifications, it is crucial to tailor lifestyle interventions that support healthy lifestyle behaviour to the preferences and requirements of the specific target group (Brunton et al., 2017). The SEM is portrayed as behaviour development embedded in multiple spheres of influence, ranging from those that are most close to an individual's experience, like the family, to those that are more distant, including policies instituted at different levels that each have an impact on developmental processes (Fiese & Jones, 2012). For this PhD research, understanding dietary

behaviours will be within the context of the SEM, underscoring the complex interplay between factors. This study will systematically examine factors at four levels of the SEM: Intrapersonal, interpersonal, socio-cultural and environmental (Figure 2.3). Each of these levels will be discussed in the subsequent sections.

Figure 2.3: Social-ecological model of Overweight and Obesity



2.9.1.1 Intrapersonal Determinants of Overweight and Obesity

The first level of the SEM is the intrapersonal level. It explains the biological and individual factors that increase the risk of overweight and obesity. These determinants may include knowledge, attitudes, and behaviours towards food, exercise, and nutrition, in addition to age, race, gender, and genetic predisposition (Sarrafzadegan et al., 2014). The following section will discuss the individual beliefs and knowledge of obesity and the biological and genetic factors as intrapersonal determinants of obesity.

2.9.1.1.1 Knowledge and Beliefs of Health Consequences of Obesity

As previously highlighted, the causes for obesity are complex (Blüher, 2019). However, behavioural modification models based on psychology have shown that an individual's intention to modify their behaviour can rely on several factors, such as their perception of their own behaviour as "unhealthy" or their belief that altering their behaviour will reduce their risk of developing health issues (Ajzen, 1985; Prestwich et al., 2017). As a result, behaviours undertaken to prevent or treat obesity may be affected by knowledge and beliefs about the causes of overweight and obesity, personal eating habits, levels of physical activity, personal motivation, self-efficacy and other psychological factors (Prestwich et al., 2017). Additionally, the Health Belief Model states that one of the main predictors of changing health behaviour is perceived susceptibility to disease (Janz & Becker, 1984), suggesting that people who believe they are more susceptible to disease or health condition are more likely to change their behaviour and accept tailored interventions.' Thus, recognition of one's own obesity and its health risks is a prerequisite to seeking treatment (Sivalingam et al., 2011).

Few studies, albeit primarily in the US, have examined the racial/ethnic disparities in adults' knowledge and understanding of the health consequences of overweight and obesity, with Black African adults reporting less knowledge than White adults (Sivalingam et al., 2011). The US survey by Sivalingam and colleagues (2011) on ethnic differences in the self-recognition of obesity and obesity-related comorbidities, revealed that race and ethnicity have an impact on people's perceptions of their own obesity as well as their knowledge of its relationship to morbidity and mortality. The authors argue that people may be less likely to recognise their own obesity when obesity is more common among an ethnic group, in this case, Black adults where obesity is perceived to be normal. These differences in self-recognition among ethnic groups

may be due to different sociocultural norms, dietary practices, and contextual body image (Dubowitz et al., 2008; Gordon-Larsen et al., 2003). These studies found ethnic variations in the recognition of obesity disappeared when the BMI exceeded 35 kg/m². By ethnicity, African American adults were significantly less likely than Whites or Hispanics to regard obesity as a health issue (77% vs. 90% vs. 88%). Likewise, Black Adults were less likely to recognise the connection between obesity and diabetes, heart disease, and hypertension than their White counterparts. These findings suggest that there are notable disparities in the awareness and recognition of obesity as a health issue, as well as its associations with chronic diseases across different ethnic groups. Specifically, the lower likelihood among African-American adults to regard obesity as a health concern may indicate a potential gap in understanding or acknowledgement of the health risks associated with excess weight within this demographic. Additionally, the reduced recognition of the connections between obesity among Black adults compared to their White counterparts underscores the importance of targeted health education efforts to address and bridge these awareness gaps (Sivalingam et al., 2011). In the same way, other studies on weight misperception by race and ethnicity have also reported weight underestimation more prevalent in Black Africans than in Whites (Dorsey et al., 2009; Johnson et al., 2009).

Conversely, Winston et al. (2014) conducted a study examining the knowledge of health consequences associated with obesity among Black and Hispanic adults living in urban, low-income communities. The study reported that a high proportion (>90%) of overweight and obese Black adults were aware of the increased risks of cardiovascular and respiratory diseases linked to overweight and obesity (Winston et al., 2014). This pattern was also reported in the study by Okop et al (2016) among South African adults, where all participants regarded the severity of

obesity as a threat to their health. However, overweight women did not because they considered being overweight as 'normal'. Additionally, research demonstrates that Black African women's knowledge and awareness of the relationship between obesity, unhealthy eating habits, and physical inactivity varies. Acheampong and Haldeman's (2013) study on knowledge and attitudes among low-income African American and Hispanic overweight and obese women reported good nutrition knowledge (90%) and positive attitudes towards nutrition and healthy eating (63%) among African American women (Acheampong & Haldeman, 2013). However, despite their good knowledge of healthy food choices, only 18.5% described their diet as healthy. In the same vein, their study found that although the majority of African women agreed that fruits and vegetables are vital components of a healthy diet, their actual consumption was generally low. This suggests that although these Black African women had good knowledge of healthy eating, they may not be utilising it to make healthy dietary choices. It is also possible that this could be due to the non-practical or non-culturally tailored information being shared with these populations.

2.9.1.1.2 Biological and Genetical Factors

Genetic predisposition plays a significant role in the prevalence of overweight and obesity among Black Africans. Variations in genes such as the fat mass and obesity-associated (FTO) gene and MC4R contribute to increased adiposity, differences in body composition, and metabolic responses unique to this population. These genetic influences interact with environmental and lifestyle factors, affecting susceptibility to weight-related conditions (Hennig et al., 2009; Yako et al., 2013).

Furthermore, research highlights disparities in fat oxidation between Black and White women. African women exhibit lower fat oxidation and higher carbohydrate oxidation, particularly when exposed to high-fat diets. This metabolic pattern promotes fat storage when carbohydrates are not rapidly utilised (Berk et al., 2006). Similarly, studies indicate that African American women have higher free fat mass and lower fat oxidation compared to White women, contributing to obesity risks (Rotimi et al., 2017; Weyer et al., 1999). African women also demonstrate reduced fat oxidation during rest and low-intensity exercise, further exacerbating fat accumulation (Hickner et al., 2001).

2.9.1.2 Interpersonal Determinants of Overweight and Obesity

The interpersonal level of the SEM encompasses social interactions and relationships influencing health behaviours. It examines how family, friends, and social networks impact individual choices. Social support, norms, and relationships play a pivotal role in shaping health-related decisions within this level of influence (Sarrafzadegan et al., 2014). The following sections discuss the influence of family support and social networks on dietary and lifestyle behaviours.

2.9.1.2.1 Family and Structured Support

The role of the family is a very intricate factor when understanding the experiences of Black African women (Spinner, 2022). Their social networks, which include friends and family, have an impact on their eating habits, food preferences, physical activity levels, and types of physical activity (Spinner, 2022). Due to the community culture within this population, African women need social support to encourage them to follow healthy lifestyles (Barnett & Praetorius, 2015). Studies have demonstrated how Black African women's support systems may "make or break" their motivation to change their lifestyles; perhaps an already delicate motivation to change

(Befort et al., 2008). One of the most significant findings from research is that family and culture are indeed an antithesis in motivating people to alter their lifestyles (Barnett & Praetorius, 2015). The notions of eating as comfort and being thin as unhealthy, permeate every aspect of a Black African woman's existence (Puoane et al., 2006), including how she interacts with her family, church, and social organisations (Holdsworth et al., 2020), how she cares for her family and even how she is expected to look (Befort et al., 2008). If African women make the change towards a healthy lifestyle, they may not only be riddled with behavioural modification difficulties but also with the potential for ridicule from their support systems (Barnett & Praetorius, 2015). They could ultimately have to choose between "going it alone" and staying with their now-unsupportive "support" networks (Barnett & Praetorius, 2015). For example, Befort et al.'s (2008) study on Black women found opposing outcomes. On the one hand, it was reported that family members' lack of support had a negative effect on overweight and obese women, making it challenging for them to reduce their weight and increase their physical activity. These family members are often overweight themselves hence do not see overweight or obesity as a problem and are unmotivated and unaware of the need to lead healthy lives. On the other hand, women who received positive support and had family members with ideal health strived to lose weight and aspired to be like their idyllic family members. Likewise, positive family support in the form of the provision of healthy eating resource materials and consistent positive reinforcement has proven to be effective in enhancing motivation for weight loss among obese Black women (Befort et al., 2008). It is therefore evident that the lack of structured support presents a great difficulty for African women since, given the communal nature of this population, "going it alone" is neither encouraged nor comfortable. Therefore, it is not unexpected that African women continue to identify a need for structured support in leading healthy lives and for weight loss.

An equally important concept that relates to the broader discussion about cultural values within Black African communities is the respect for family culture. Family culture is a core value that resonates strongly with Black Africans. Many African families regard their mothers, grandmothers, and aunts as matriarchs, and these women express their love for their families by cooking. Notwithstanding, not all foods are healthy (Befort et al., 2008). These cultures and traditions pertaining to cooking practices and approaches to expressing love within Black African families are consciously or subconsciously preserved and passed down to generations (Befort et al., 2008)

2.9.1.3 Socio-Cultural Determinants of Overweight and Obesity

Regarding improving overall nutrition and physical activity, numerous cultural aspects must be understood about Africans when examining their foods and food patterns. The external social and cultural factors, including social networks and familial background, that affect weight loss and maintenance are complex (Spinner, 2022). Important social and cultural influences on decision-making about weight include stigma, body perception, cultural eating practices, stress, and religion (Spinner, 2022). Moreover, an individual's culture may impact how they perceive their own health and wellness, and many cultures have varied perspectives and approaches to food and physical activity habits, which are influenced by their traditions and histories (Bahr, 2007). These areas will be expanded upon in the below sections.

2.9.1.3.1 Social and Cultural Impact on Food Intake in Black Africans

Food plays a central part in the culture, traditions and daily life of African people. Food is also applicable to social and important events which include weddings, memorial services, and religious festivities; these events are always accompanied with traditionally prepared cuisine

made especially for the occasion (Puoane et al., 2006). Food is a cultural symbol and eating is a symbolic act through which Black African people communicate, perpetuate and develop their knowledge, beliefs, feelings and practices towards life (Airhihenbuwa et al., 1996).

Among Black Africans, food not only nourishes the body but also serves as a symbol of friendliness, acceptance, and warmth (Holdsworth et al., 2020). The typical African tradition associates daily meat eating with a high socioeconomic position, whereas daily vegetable consumption is linked to a low socioeconomic status (Holdsworth et al., 2020). Food consumption in large quantities is correlated with affordability. Furthermore, celebrations, traditions, and welcoming guests all involve food, as do other social gatherings and interactions. The consumption of cakes, ice cream, and other sweets is normal during ‘happy’/celebratory occasions. Lean meat and black tea are frequently consumed at times of grief whereas fatty meat is a symbol of generosity. Moreover, eating behaviours and food customs are learned and often passed down from mothers to daughters (Befort et al., 2008; Wilson et al., 2004). Additionally, some Africans feel as though they are giving up their family's traditions of fried food, high-fat foods, and sweets when they consider eating healthily (Wilson et al., 2004).

2.9.1.3.2 Body Image Perception in Black Communities

Building on the cultural significance of food within Black African communities highlighted above, this subsection explores the intricate relationship between body image perception and cultural influences. Africans have historically been known to embrace bigger body types, which makes changing behaviour and maintaining weight loss difficult (Draper et al., 2016). Body image is defined as one's perception of one's body (Altabe, 1998). In Black African women, body image is partly determined by culture (Caradas et al., 2001), urbanisation and socioeconomic status (Puoane & Mciza, 2009; Stern et al., 2010). Research has repeatedly found that African

women and their families are more accepting of and prefer larger body figures than White women (Shoneye et al., 2011). Overweight and obesity is not only viewed as attractive but also as a sign of affluence (Matoti-Mvalo & Puoane, 2011). However, this cultural preference needs to be weighed against the reality that African women who are overweight or obese are more likely to suffer diabetes, high blood pressure, and obesity (Carnethon et al., 2017).

The desire to lose weight by a person has largely been attributed to body dissatisfaction (Sarwer et al., 2005). Although having greater body satisfaction may be protective against engaging in unhealthy or inappropriate weight control behaviours, studies have shown that African women with higher body size satisfaction may be less motivated to reduce weight (Fitzgibbon et al., 2000; Robinson et al., 2012). The cultural pressures associated with self-acceptance are particularly notable in that they drive African women to resort to ambivalent feelings, adding to the barriers of behaviour change (Carter-Edwards et al., 2010; Draper et al., 2016). Therefore, in order to promote behaviour change and weight loss among Black African women who are satisfied with their size or for whom there is a disconnect between weight and health, a weight-driven or appearance-driven approach may not be the most effective strategy. A more appropriate approach would be to focus on a holistic and health-centred approach rather than a weight-driven or appearance-driven strategy (Carter-Edwards et al., 2010; Draper et al., 2016). This approach should encompass education about the health risks associated with obesity, promoting overall well-being, and encouraging positive lifestyle changes that align with cultural values and preferences (Carter-Edwards et al., 2010). This is further substantiated by the Health at Every Size (HAES) approach (Bacon & Aphramor, 2011; Penney & Kirk, 2015), a shift from a weight-focused to a health-focused approach. It proposes that any intervention strategy for obesity should be one to promote the development of healthy lifestyles and not be limited to body weight

or body composition (Miller, 1999). Within the HAES approach, it has been suggested that interventions centre on encouraging body acceptance, supporting intuitive eating and supporting active embodiment (Bacon & Aphramor, 2011).

2.9.1.4 Environmental and Societal Determinants of Overweight and Obesity

This level, within the SEM, examines the impact of the physical and policy environment on lifestyle choices. It encompasses access to healthy food options, built environments supporting physical activity, and broader societal influences such as advertising, and socioeconomic conditions. The section below discusses food availability and socioeconomic conditions, inequalities in access to healthy foods and the built environment and infrastructure.

2.9.1.4.1 Obesogenic Environments

The obesogenic environment describes the potential influence of environmental factors on both diet and physical activity (French et al., 2001). Environmental factors may influence levels of physical activity as well as the accessibility and intake of certain foods. Unfavourable environments, such as limited access to recreational spaces and areas with few options for healthy food choices, may play a role in the decline in community levels of physical activity and the rapid increase in obesity rates (French et al., 2001).

The connection between the environment, diet, and obesity may be mediated by the cost and availability of food (Jones et al., 2007). Local availability of high-quality foods is believed to improve dietary quality in populations. This is supported by the US study by Morland et al. (2006), which found an association between the availability of local supermarkets and lower obesity prevalence (Morland et al., 2006). However, food prices and availability vary between neighbourhoods, with higher-quality items being scarcer and more expensive in poorer areas

(Chung & Myers, 1999; Morland et al., 2002). Racial inequalities in supermarket access also persist, with Black communities having to travel farther to access supermarkets than White communities (Bower et al., 2014). This disparity highlights systemic and structural inequalities that disproportionately affect Black populations, including Black African women, potentially contributing to poor dietary patterns and higher obesity rates.

In the UK, the evidence regarding social and environmental inequalities in food provision is less conclusive. Early studies hypothesised similar inequities to those in the US, associating high costs and limited availability with area deprivation (Cummins & Macintyre, 2006). However, larger studies have not confirmed an independent relationship between food provision, dietary patterns, and fruit and vegetable consumption (Pearson et al., 2005; White et al., 2004).

Similarly, research on differences in food prices and supermarket accessibility in deprived versus affluent areas has been inconclusive (Cummins & Macintyre, 1999, 2002). The reasonable availability of diverse ‘healthy’ foods in urban areas has also not consistently demonstrated clear inequities (Guy & David, 2004).

Another key factor is the prevalence of fast-food outlets and restaurants, which contributes to overconsumption and poor dietary choices (Roberto et al., 2015). Eating out is often associated with higher energy intake; for example, meals consumed outside the home are up to 65% more energy-dense than a typical diet and contribute to poorer nutritional intake (Burns et al., 2002; Prentice & Jebb, 2003). While this issue applies broadly, it is important to consider its relevance for Black African women, particularly in urban settings where the convenience of fast food may outweigh access to fresh produce. Cultural influences may also affect dietary behaviours, such as the frequency of eating out or familiarity with food labels and nutritional information. Limited

engagement with food labels or understanding of their implications for health can hinder informed food choices (Jayasinghe et al., 2025; Osman & Jenkins, 2021).

Urban planning and transportation infrastructure also influence obesity rates (Bracy et al., 2014). Accessible recreational spaces, pedestrian-friendly neighbourhoods, and cycling paths promote physical activity. For Black African women, perceived safety and convenience may significantly impact the likelihood of engaging in physical activity. Studies indicate that racial and ethnic minorities, including Black African women, are more likely to be physically active in safe neighbourhoods, highlighting the importance of addressing environmental inequalities to support healthier lifestyles (Bracy et al., 2014). Perceptions of convenience, such as access to exercise facilities, also show positive associations with physical activity levels (Wilcox et al., 2003).

2.10 Research Design

This thesis adopted a mixed-methods research design to address the complexity of its study objectives, which required both outcome and process measurements. The terms 'multi-method' and 'mixed-method' are often used to describe the integration of qualitative and quantitative approaches in research design, measurement, and analysis, either to answer a single question or a set of interrelated questions (Patton, 1990; Tashakkori & Teddlie, 2003). This approach was particularly relevant to this thesis, as it posed multiple questions that necessitated descriptive, explanatory, and exploratory data for comprehensive insights.

In navigating the complexities of research methodology, this thesis adopts a dual philosophical approach, incorporating both positivism and interpretivism. Positivism, with its emphasis on objectivity and empirical evidence, contributes rigor and reliability to the study, ensuring a systematic and structured analysis (Bryman, 2006). Conversely, interpretivism is embraced for

its focus on understanding subjective experiences and meanings, allowing for a nuanced exploration of diverse perspectives (Bryman, 2006). While it is debatable if combining approaches from different paradigms is suitable (Mingers, 2001), a pragmatic perspective is adopted, challenging deterministic links between research strategy and epistemological assumptions (Bryman, 2006; Creswell & Creswell, 2017; Tashakkori & Teddlie, 2003). This pragmatism is complemented by Greene et al.'s (1989) typology for mixed methods, providing flexibility and diverse benefits such as seeking convergence, corroboration, and expanding the depth of inquiry (Greene et al., 1989). Within this methodological framework, a participatory research plan is introduced, aligning with interpretivist principles and emphasising participant engagement for a richer understanding of lived experiences. This inclusive approach aims to capture both quantitative and qualitative dimensions, fostering a comprehensive exploration of the research questions and promoting a holistic understanding of the phenomena under investigation.

2.11 Ethical Considerations

Ethical decisions in research are those that "arise when we try to decide between one course of action and another not in terms of expediency or efficiency but by reference to standards of what is morally right or wrong" (Barnes, 1979: 16). Ethical considerations in human research should be recognised to minimise harm, protect participants' rights, privacy, and safety in accordance with the Nuremberg Code and Helsinki Declaration (WMA, 2022), and to mitigate the risk of non-maleficence (Beauchamp & Childress, 1994). By enabling researchers to foresee the ethical tensions and challenges that may develop during study problems, ethical guidelines aim to direct thought when seeking for ethical approval (Reid et al., 2018). The use of suitable ethical

concepts will enable this. It is the researcher's responsibility to protect the participants (Orb et al., 2001), hence it is crucial to show that all ethical issues have been taken into account.

Social constructions of body weight are ingrained in the way that our society perceives and reacts to obesity (Puhl & Brownell, 2003; Weiner et al., 1988). In our societies, body weight is still largely seen as an individual responsibility and obese people as architects of their own ill health due to laziness and overeating (Kim & Anne Willis, 2007; Rich & Evans, 2005). These widespread assumptions serve as the foundation for the stigma associated with being overweight, which is frequently dismissed as acceptable. This study recognises that participants who have overweight or obesity might experience enacted stigma from peers or other persons external to the study. In this context, general research ethics requires a consideration of the participant's safety. Therefore, ethical considerations, principles and values that will guide the conduct of this research and interactions with participants to minimise harm and maximize benefits will include anonymity, power balance, data privacy and confidentiality, informed and written consent and non-maleficence.

2.11.1 Ethical Approval

Ethical approval for all stages of this research was obtained from the St Mary's University Research Ethics Committee. All procedures were in accordance with regulations and guidelines approved by the ethics committee.

Chapter 3

Thesis study map: Study 1

Study	Objectives
Study 1: Effectiveness of Client-Centred Counselling on Weight Management among Black African Women with Overweight and Obesity in High-Income Countries: A Systematic Review	Objectives: To evaluate the effectiveness of client-centred counselling on weight management in Black African women with overweight and obesity and provide information about: • specific intervention component and skills used • culturally tailored strategies, and theoretical underpinnings
Study 2: Modification and validation of the EPIC FFQ to assess dietary intake in Black African adults	Objectives: • To modify the EPIC FFQ to better reflect the dietary habits, cultural food practices, and food preferences of Black African adults • To validate the modified EPIC FFQ
Study 3: Assessment of Dietary Patterns among Black African Women from sub-Saharan Africa living in the UK	Objectives: • To determine the dietary intake and associated demographic factors • To classify dietary patterns and any associated determinants.
Study 4: A qualitative study exploring factors influencing dietary choices of Black African women with overweight and obesity from Sub-Saharan African living in the UK	Objectives: • With dietary patterns identified from study 3, investigate the factors that influence Black African immigrant women's dietary choices and eating habits.
Study 5: A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women (The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change Wheel	Objectives: • With findings from study 1, 2, 3 and 4, design a nutritional and lifestyle program targeting overweight and obesity among Black African women in the UK

Chapter 3

Study 1: Effectiveness of Client-Centred Counselling on Weight Management among Black African Women with Overweight and Obesity in High-Income Countries: A Systematic Review

3.1 Introduction

Obesity has evolved from a known public health issue in rich and affluent societies to a global public health threat seen to be on the rise in the last 30 to 40 years (Finucane et al., 2011).

Globally, the prevalence of overweight and obesity is increasing in both developing and developed countries however, obesity is more prevalent in HICs such as the US, the UK, and Australia (Ng et al., 2014) and its prevalence varies greatly by ethnicity. In the United Kingdom, for example, the 2019 Health Survey for England (Health Survey, 2019) found obesity rates highest among Black African and Black Caribbean women (who are predominantly migrants) at 37% and 44%, respectively. Obesity contributes to a disproportionate share of chronic health conditions and noncommunicable diseases such as type 2 diabetes, cardiovascular disease, coronary heart disease, and various types of cancer (Hales et al., 2018; Puska et al., 2003).

There is variation in the prevalence and risk of obesity between and within populations which is likely to be due to genetic, ethnic differences and the extent to which local environments are considered ‘obesogenic’ (Murphy et al., 2017). Although the causes of obesity in African migrant women are multifactorial including but not limited to the “influence of migration” (Alyousif & Mathews, 2018; Osei-Kwasi et al., 2017), studies on migrant populations have shown that migration from one country to another is associated with changes in dietary behaviours and physical activity (Alyousif & Mathews, 2018; Osei-Kwasi et al., 2017; Satia, 2010). Evidence suggests that migrants from disadvantaged socio-economic backgrounds are more likely to experience obesity or be overweight than those from advantaged backgrounds (McLaren, 2007;

Stamatakis et al., 2005). Most often, migrant populations tend to adopt the norms of the new host country, a phenomenon referred to as acculturation (Cunningham et al., 2008). Other factors that can explain differences in obesity in African women are cultural perception of body image (Toselli et al., 2016; Whitaker et al., 2016), the obesogenic environment (Murphy et al., 2017) and genetic predisposition (Hennig et al., 2009; Yako et al., 2013). Parental lifestyle choices have a direct impact on children's weight status, therefore targeting women who are main caregivers might be an effective strategy in reducing health inequalities and addressing overweight and obesity across all age groups (Shonkoff et al., 2012). Furthermore, given the dynamic nature of family structures, such as an increasing number of single-parent households (Leung & Stanner, 2011) and matriarchal influences in dietary and food purchasing patterns, particularly in Black/African families, interventions aimed at women could potentially benefit the entire family.

Client-centred counselling is a non-directive approach to psychotherapy that focuses on the client's experience and needs. It is based on the idea that people are naturally motivated to achieve positive psychological functioning (Rogers, 2012). It is also used interchangeably in literature with Motivational interviewing (MI) being one approach that has been proposed to improve the efficacy of behavioural weight loss treatment. It is a collaborative style of counselling approach that uses core processes to help an individual reduce ambivalence about behaviour change: engaging with the individual, focusing on specific behaviours to change such as evoking change talk, and planning to implement change (Miller & Rollnick, 2012). It is a person-centred, non-judgmental, and directive set of skills that practitioners use to discuss changing behaviours for better health outcomes. There is emerging research on the efficacy of client-centred counselling in the context of obesity prevention and management. A narrative literature review by DiLillo and West evaluating the unique contributions of client-centred

counselling incorporating motivational interviewing on weight loss elucidated the effectiveness of client-centred counselling delivered as an independent component and in addition to a behavioural weight loss program (DiLillo & West, 2011).

Systematic reviews utilising MI with adults with overweight and obesity in primary care settings (Barnes & Ivezaj, 2015) and using eHealth and telehealth as a mode of delivery of interventions (Patel et al., 2019) found about 54% of included randomised controlled trials (RCTs) reporting significant weight loss of at least 5% compared to baseline body weight among treatment groups. Armstrong et al (2011) conducted a meta-analysis of 11 RCTs recruiting adults with overweight and obesity and found that MI had a significant, moderate effect [standardized mean difference (SMD) = 0.51] on weight loss compared to controls, such as usual treatments or advice (Armstrong et al., 2011). Conversely, a recent systematic review and meta-analysis by Makin et al (2021) found client centred counselling incorporating MI as a non-beneficial approach among individuals with overweight and obesity. Their meta-analysis of 12 trials indicated no overall pooled effect of MI on body weight and Body Mass Index (BMI) outcomes between intervention and control groups.

While findings from previous studies are promising, the resultant effects showed modest and heterogeneity in outcomes. An additional limitation is the lack of systematic reviews of intervention studies targeting Black African women, as the majority of previous studies have focused exclusively on White populations. Only few studies included a sub-sample of African American women (DiLillo & West, 2011; Makin et al., 2021) with no examination of racial differences in intervention effectiveness. Therefore, little is known about the effectiveness of client centred counselling on weight loss in Black African women, despite their increased burden of overweight and obesity (HSE, 2019). Black Africans tend to lose less weight and at a slower

rate when compared to Whites and other racial/ethnic groups (Kumanyika, 2002, 2004). Black African women are also less likely to participate in and adhere to weight loss interventions (Anderson et al., 2015). They are often faced with multiple barriers, such as time constraints associated with low-income jobs with minimal flexibility, parenting responsibilities, lack of transportation, and related social stressors. These challenges have been specifically reported by Black African women and can impede their engagement in interventions that promote healthy lifestyle behaviours (Anderson et al., 2015).

The present systematic review aims to evaluate the effectiveness of client-centred counselling on weight management based on weight changes and lifestyle modifications, among Black African women in high-income countries. Black African refers to individuals of sub-Saharan African descent. This review aimed to include women from African countries residing in high-income countries, defined as those with a Gross National Income per capita of \$12,376 or more (Prydz & Wadhwa, 2019). This systematic review also aims to provide information about specific intervention components, such as skills used, culturally tailored strategies, and theoretical underpinnings, allowing the identification of intervention components that might be useful for effective weight loss and weight loss maintenance in Black African women.

3.2 Materials and Methods

This systematic review was reported according to the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines (Page et al., 2021) and registered with the International Prospective Register of Systematic Reviews (PROSPERO) with registration number (CRD42022330020) (Olaoye et al., 2022).

3.2.1 Eligibility Criteria

The eligibility criteria of studies included in this review was based on study characteristics following the PICOS framework (Population, Intervention, Comparison, Outcome and Study design) (Amir-Behghadami & Janati, 2020) described below:

3.2.1.1 Population

Studies of women identified as Black African migrants from sub-Saharan Africa living in HICs, aged ≥ 18 years and considered to be overweight or obese ($\text{BMI} \geq 25\text{kg/m}^2$) were included.

Studies among other ethnicities and in children were excluded.

3.2.1.2 Intervention

All studies evaluating the efficacy of client-centred counselling for weight management were systematically reviewed. Client-centred counselling was operationalised as both one-on-one and group-based interventions, including motivational interviewing, behavioural counselling, cognitive behavioural therapy (CBT), and shared decision-making, either as standalone treatments or in conjunction with nutritional education and lifestyle modifications. The integration of CBT with MI is justified due to their complementary roles in facilitating behaviour change. MI addresses motivational ambivalence and enhances client motivation, while CBT provides structured methodologies to tackle cognitive and behavioural barriers, supporting long-term behavioural change. Both emphasize client autonomy and empowerment, aligning with client-centred care principles. The combination of CBT and MI is commonly used, offering a strategy that addresses motivational and behavioural aspects, improving effectiveness in obesity management and promoting sustainable weight loss (Butryn et al., 2011; Cooper & Fairburn, 2002). MI has also been used alongside CBT for anxiety disorders, with four overlapping CBT elements: problem-oriented focus, case formulation, skills training, and behavioural activation

(Randall & McNeil, 2017). Studies that did not state the mode of counselling employed were excluded.

3.2.1.3 Outcomes

To be included, a study had to report a primary weight outcome measured either as weight loss or BMI, with or without additional body composition outcomes such as waist circumference, waist-hip ratio. Lifestyle modifications such as changes in physical activity and eating behaviours were included as secondary study outcome measures where available. Where at least one of the primary study outcomes was not reported, the study was excluded.

3.2.1.4 Study Design

The review included all experimental study designs that were RCTs, non-randomised control trials, quasi-experimental trials and follow-up studies conducted prospectively or in retrospect. Cross-sectional studies, systematic reviews and studies of qualitative study designs were excluded.

3.2.2 Search Strategy

Original searches took place in June 2022. The following databases were searched: MEDLINE, OVID, PubMed, PsycINFO, CINAHL and the Cochrane Library using a coverage period of 1970 to present. This period is documented as the peak of start of Africans migrating into HICs (Zlotnik, 2004). Additional studies were searched from reference lists of articles eligible for full-text review and Google Scholar. While grey literature databases such as ProQuest and OpenGrey were searched as part of the systematic review, none of the studies retrieved from these sources met the inclusion criteria for the final analysis. As a result, all included studies were sourced from peer-reviewed journals. Language restriction to studies published in English language was

applied. To develop comprehensive strategies based on the search database of interest, searches were developed by locating key terms from published articles, controlled vocabulary, and preliminary results from scoping searches. The following keywords were combined with Boolean operators: Counselling, Client-centred, Weight management or weight loss, Black, African (Appendix 1). In addition, database-specific search strategies were used: Thesaurus of Psychological Index Terms for PsycINFO, Medical Subject Headings (MeSH) for PubMed and Cochrane Library.

3.2.3 Study Selection

All articles were screened using Rayyan, a mobile and web application for systematic reviews (Ouzzani et al., 2016) using predefined inclusion and exclusion criteria which was based on the PICOS framework. Following removal of duplicates, initial screening of all remaining articles and abstracts was done by primary author (IO). Papers were assessed with responses of “include”, “exclude” or “maybe”. Articles assessed as “maybe” were resolved by discussion with the supervisory team (NB, KM, EK, FT). IO and NB independently screened full texts of eligible articles for inclusion, reaching consensus for inclusion, similar to the strategy used by Makin et al (2021).

3.2.4 Data Extraction

Data extraction sheets were developed using the intervention description and replication checklist template (TIDieR) (Hoffmann et al., 2002). This included a description of the study setting, participants’ demographics, sample size, host country, duration of residence in the host country, content of intervention, delivery method of intervention, frequency and duration of intervention, theory used, main health outcomes, and intervention effects. The primary outcome

measurements of body weight information were extracted as reported from baseline to the most recent point of follow-up. In addition, secondary outcomes of lifestyle changes such as physical activity or dietary habits were extracted. Data extraction from eligible studies was first completed using a Microsoft Excel spreadsheet by the primary author (IO). Ten percent of extracted data were randomly selected and independently checked by a second reviewer (KM) for accuracy and consistency. Any discrepancies were resolved through discussion.

3.2.5 Risk of Bias Assessment

Following data extraction, papers were evaluated for risk of bias. The Cochrane Collaboration risk of bias tool (RoB 2) (Sterne et al., 2019) was used to evaluate randomised controlled trials. The RoB 2 focuses on five distinct domains: 1. Bias resulting from the randomization process; 2. Bias resulting from deviations from intended interventions; 3. Bias resulting from missing outcome data; 4. Bias in outcome measurement; and 5. Bias in the selection of the reported result. IO and KM independently applied the tool to each of the included studies, recording risk of bias judgements of low risk, high risk, or some concerns for each domain. Following the guidelines for using the RoB 2 tool, an overall summary risk of bias judgement (low, high, or some concerns) was derived for each study. To assess the risk of bias in non-randomized articles, the Risk of Bias in Non-randomized Studies-of Interventions tool (ROBINS-1 tool) was used (Sterne et al., 2016), which also focuses on a study's internal validity and covers seven domains of bias: confounding, participant selection, intervention classification, deviations from intended intervention, missing data, outcome measurements, and bias in reporting selection, resulting in scores of high, low or moderate risk of bias.

3.2.6 Effect Measures

Our study's outcome evaluation used mean changes before and after the intervention, together with p-values presented as statistical significance measures of included studies. These results are presented in Table 3. Effect sizes were not pooled with meta-analysis due to heterogeneity of design of studies.

3.2.7 Data Synthesis

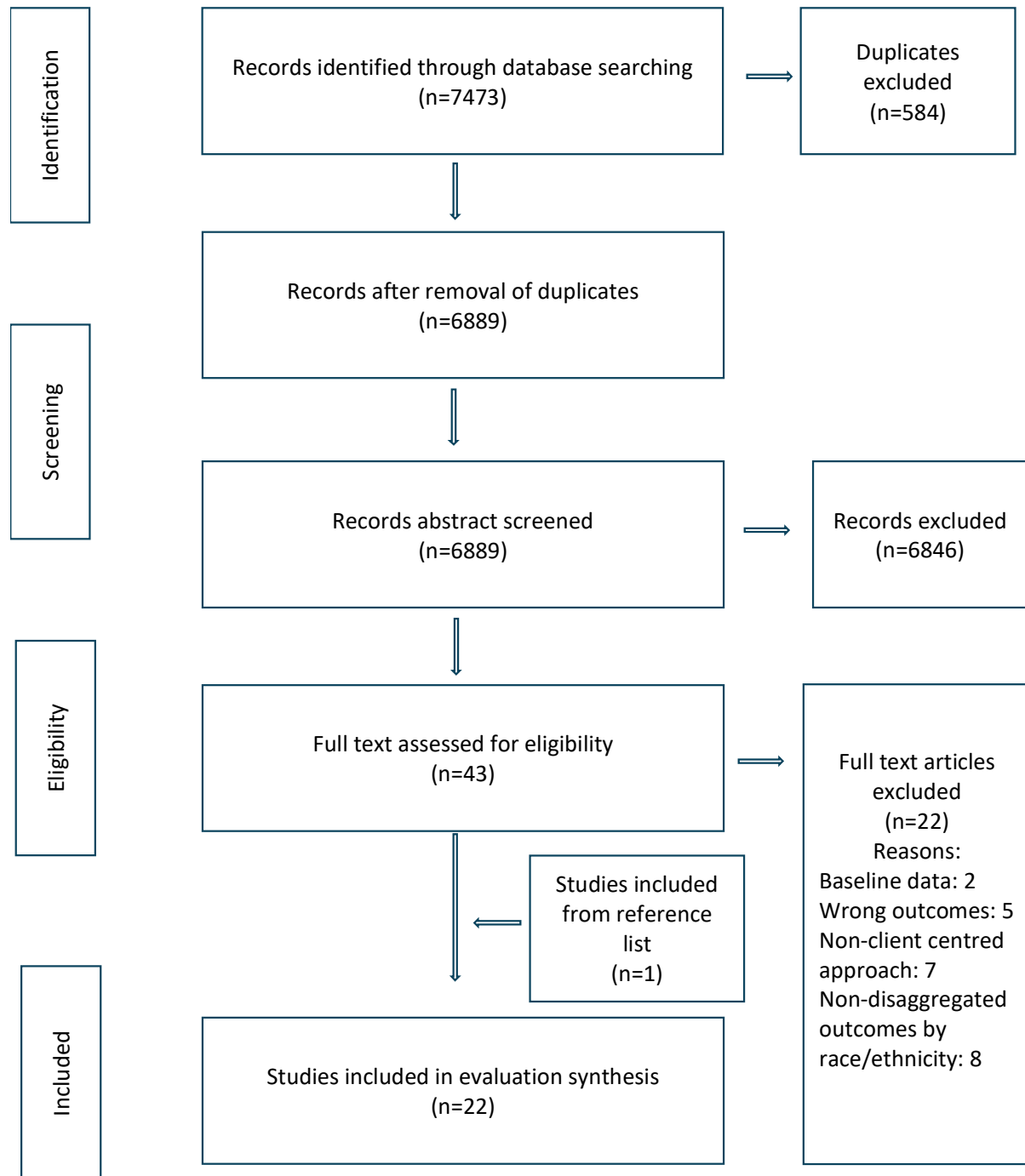
In the present review, study duration and reported outcome measurements differed between studies. Included studies also differed in results presentation, reporting means and percent weight change. The studies were deemed too heterogeneous to conduct a meta-analysis (Chandler et al., 2019), therefore a narrative synthesis of study outcomes was conducted, and effect sizes were provided (where possible) to evaluate intervention effects.

3.3 Results

3.3.1 Search Results

Figure 3.1 summarises the data extraction flow diagram. The first database searches produced 7473 results from CINAHL (n=435), OVID (n=106), Cochrane Library (n=1970), PsycINFO (n=752), PubMed which includes Medline (n=4192), ProQuest dissertation and abstract (n=10) and Open Grey (n=8). Following removal of duplicate articles (n=584), the initial screening consisted of a review of the study title and abstract. Following a review of the titles and abstracts, 43 full texts were chosen for full text screening. The most common reasons for exclusion were irrelevant studies (n = 6847), incorrect study population (n = 23), and a non-client-centred counselling approach (n = 18). The final review included 22 articles that were deemed appropriate for inclusion.

Figure 3.1: PRISMA data extraction flow diagram



3.3.2 Characteristics of Included Studies

All included studies were conducted in the US and were published in peer reviewed health journals between 1997 to 2019. Participants were recruited mainly from hospital settings (n=8) (Bennett et al., 2013; Hollis et al., 2008; Lutes et al., 2017; Martin et al., 2006, 2008; Sheppard et al., 2016; West et al., 2019; Wilbur et al., 2016), and the community (n=14) (Ard et al., 2017; Befort et al., 2008; Cahill et al., 2018; Chung & Myers Jr, 1999; Fitzgibbon, Stolley, Ganschow, et al., 2005; Haire-Joshu et al., 2019; Herring et al., 2016; Liu, Wilcox, et al., 2015; McNabb et al., 1997; Stolley et al., 2017; Stolley, Fitzgibbon, et al., 2009; Weerts & Amoran, 2011; West et al., 2007; Yanek et al., 2001).

Study designs utilised were RCTs (n=19) (Ard et al., 2017; Befort et al., 2008; Bennett et al., 2022; Cahill et al., 2018; Fitzgibbon, Stolley, Ganschow, et al., 2005; Haire-Joshu et al., 2019; Herring et al., 2016; Hollis et al., 2008; Lutes et al., 2017; Martin et al., 2006, 2008; McNabb et al., 1997; Sheppard et al., 2016; Stolley et al., 2017; Weerts & Amoran, 2011; West et al., 2007, 2019; Wilbur et al., 2016; Yanek et al., 2001), and intervention studies with longitudinal follow-up (n=3) (Chung et al., 2016; Liu, Wilcox, et al., 2015; Stolley, Sharp, et al., 2009). In RCTs, comparators to intervention were “treatment as usual or standard” (Herring et al., 2016; Lutes et al., 2017; West et al., 2019), traditional health education (Cahill et al., 2018; Haire-Joshu et al., 2019; West et al., 2007), non-MI content of intervention (Befort et al., 2008; Weerts & Amoran, 2011), or traditional advice or handouts (Bennett et al., 2013; Martin et al., 2006, 2008; McNabb et al., 1997; Stolley et al., 2017; Yanek et al., 2001) and waitlists (McNabb et al., 1997; Sheppard et al., 2016). Of the three intervention studies with longitudinal follow-up, only one used a control group (Liu, Wilcox, et al., 2015).

Weight loss outcomes were reported as body weight change in kilograms (n=10) (Bennett et al., 2013; Cahill et al., 2018; Haire-Joshu et al., 2019; Herring et al., 2016; Liu, Davidson, et al., 2015; Lutes et al., 2017; Martin et al., 2006, 2008; Stolley et al., 2017; West et al., 2019), pounds (n=2) (McNabb et al., 1997; Weerts & Amoran, 2011), percent weight loss (%) (n=2) (Ard et al., 2017; Sheppard et al., 2016), change in BMI (n=1) (Chung et al., 2016), and a combination of both body weight kg and BMI (n=6) (Befort et al., 2008; Fitzgibbon, Stolley, Ganschow, et al., 2005; Hollis et al., 2008; McNabb et al., 1997; West et al., 2007; Yanek et al., 2001).

3.3.3 Participants

Table 3.1 provides details about study participants. Sample sizes ranged from 16 (Liu, Wilcox, et al., 2015) to 540 (Hollis et al., 2008) with a total of 4073 participants recruited across all 22 studies. Age of participants ranged from 18 years to 76 years. All 22 studies were conducted among Black African women, however no study delineated countries of origin of study participants. Similarly, no information was reported on participants duration of residence in the host country. All studies included women who were overweight or obese with BMI of 25kg/m^2 . Four studies were conducted among pregnant women (Cahill et al., 2018; Haire-Joshu et al., 2019; Herring et al., 2016; Liu, Wilcox, et al., 2015), one study among breast cancer patients (Chung et al., 2016), three among breast cancer survivors (Sheppard et al., 2016; Stolley et al., 2017; Stolley, Sharp, et al., 2009) and two among type 2 diabetes patients (West et al., 2007, 2019). Only five studies (Bennett et al., 2013; Cahill et al., 2018; Haire-Joshu et al., 2019; Lutes et al., 2017; Weerts & Amoran, 2011) published information regarding the socioeconomic status (SES) of study participants describing participants as low income or socioeconomically disadvantaged.

Table 3.1 Characteristics of included studies (n =22)*

Study	Program setting	Age (years)	Baseline BMI (kg.m ⁻²)	Sample size and participant characteristics	Control group
Randomised Control Trials					
McNabb et al. (1997)	Community/ church based	≥18	30 to 45	39 African American women	Yes
Yanek et al. (2001)	Community /church based	≥40	>30	529 African American women	Yes
Fitzgibbon et al. (2005)	Hospital/faith based	≥21	≥25	59 African American women	No
Martin et al. (2006)	Hospital	18 to 65	≥25	144 obese and overweight African American women	Yes
West et al. (2007)	Community	≥18	27 to 50	217 (38% African-American women with Type 2 diabetes)	Yes
Befort et al. (2008)	Community	≥18	30 to 50	44 obese African American women	Yes
Martin et al. (2008)	Hospital	18 to 65	≥25	144 African-American women	Yes
Hollis et al. (2008)	Hospital	≥ 25	25 to 45	1685 (540 African American women)	No
Weerts & Amoran. (2011)	Community	18 to 44	≥25	21 overweight African American women	Yes
Bennett et al. (2013)	Hospital	25 to 44	25 to 34.9	194 premenopausal black female primary care patients	Yes
Herring et al. (2016)	Community/ technology based	≥18	25 to 45	66 pregnant women with overweight or obesity	Yes
Sheppard et al. (2016)	Hospital/ technology based		≥ 25 to ≤40	31 African American Breast cancer survivors	Yes
Wilbur et al. (2016)	Hospital	40-65	>30	288 African American women	No
Lutes et al. (2017)	Hospital/ community based	19 to 75	≥25	200 rural obese African American women	Yes

Stolley et al. (2017)	Community	≥18	≥25	246 black/African American women. Breast cancer survivors	Yes
Ard et al. (2017)	Community	30 to 70	≥25	409 African American women	No
Cahill et al. (2018)	Home/community	18 to 45	25 to 45	267 socioeconomically disadvantaged African American women with overweight or obesity	Yes
Haire-Joshu et al. (2019)	Home/community	18 to 45	25 to 45	267 pregnant women	Yes
West et al. (2019)	Hospital/home	45 to 76	≥25	5145 African-American, Hispanic and Non-Hispanic White women with obesity and type2 diabetes (303 African American)	Yes
Pre-post Longitudinal studies					
Stolley et al. (2009)	Community	≥18	≥25	23 black/African American women, Breast cancer survivors	No
Liu et al. (2015)	Home/community		25 to 40	16 pregnant overweight and obese African-American women recruited from prenatal clinics, <18 weeks of gestation	Yes (contemporary control)
Chung et al. (2016)	Community		≥25	26 African American breast cancer patients	No

*All studies were based in the US, provided no information on duration of residency in the country and did not specify ethnicity (country of origin)

3.3.4 Client Centred Counselling Intervention

3.3.4.1 Modes of Delivery

Client-centred counselling, which included behavioural strategies, was provided in an individual format in half of the studies (n=11) (Befort et al., 2008; Bennett et al., 2013; Cahill et al., 2018; Haire-Joshu et al., 2019; Herring et al., 2016; Liu, Wilcox, et al., 2015; Lutes et al., 2017; Martin et al., 2006, 2008; Weerts & Amoran, 2011; West et al., 2019), while nine studies were conducted in group formats (Ard et al., 2017; Fitzgibbon et al., 2005; Hollis et al., 2008; Lutes et al., 2017; McNabb et al., 1997; Stolley et al., 2017; Stolley et al., 2009; West et al., 2007; Yanek et al., 2001), and two studies used a mix of both formats (Chung et al., 2016; Sheppard et al., 2016). Studies used various modes of delivery: face-to-face in 11 studies (Cahill et al., 2018; Chung et al., 2016; Fitzgibbon et al., 2005; Haire-Joshu et al., 2019; Martin et al., 2006, 2008; McNabb et al., 1997; Stolley et al., 2009; Weerts & Amoran, 2011; West et al., 2007; Yanek et al., 2001), telephone in two studies (Bennett et al., 2022; Herring et al., 2016), and a combination of face-to-face and telephone in four studies. Of note, significant intervention effects were more frequently observed in studies that provided face-to-face sessions, either alone or in combination with telephone follow-ups. While the impact of delivery mode on weight loss is not directly compared, this trend was noted across studies reporting significant outcomes.

Duration of interventions also varied, ranging from 90 minutes over three months (Weerts & Amoran, 2011) to 37 hours over 24 months (West et al., 2019) for in-person formats. Telephone sessions ranged from 60 minutes over two weeks (Befort et al., 2008) to 240 minutes over three months (Herring et al., 2016). The majority of studies (n=14) had a follow-up of one year or less (Ard et al., 2017; Chung et al., 2016; Fitzgibbon et al., 2005; Hollis et al., 2008; Liu, Wilcox, et al., 2015; Lutes et al., 2017; Martin et al., 2006; McNabb et al., 1997; Sheppard et al., 2016;

Stolley et al., 2017; Stolley et al., 2009; Weerts & Amoran, 2011; Wilbur et al., 2016; Yanek et al., 2001), with two studies having an 18-month follow-up (Bennett et al., 2013; West et al., 2007), and one study having a 13.5-year follow-up (West et al., 2019). Interestingly, intervention duration appeared to play a role: shorter interventions (less than six months) seemed to achieve significant weight loss more frequently compared to longer interventions.

Reported interventionist backgrounds included health coaches (n=9) (Ard et al., 2017; Cahill et al., 2018; Fitzgibbon et al., 2005; Haire-Joshu et al., 2019; Herring et al., 2016; Lutes et al., 2017; McNabb et al., 1997; Weerts & Amoran, 2011; Yanek et al., 2001), registered dietitians (n=3) (Bennett et al., 2013; Chung et al., 2016; Liu, Wilcox, et al., 2015), nutritionists (n=3) (Hollis et al., 2008; Sheppard et al., 2016; Stolley et al., 2017), physicians (n=2) (Martin et al., 2006, 2008), psychologists (n=2) (Befort et al., 2008; West et al., 2007), lifestyle counsellors (n=1) (Weerts & Amoran, 2011), and registered nurses (n=1) (Wilbur et al., 2016). Four studies (Chung & Myers Jr, 1999; Herring et al., 2016; Martin et al., 2006; Weerts & Amoran, 2011) gave no information on the duration of interventionist training but of those that did, this ranged from nine hours (Martin et al., 2006, 2008) to two days (Befort et al., 2008; Bennett et al., 2013; West et al., 2019; Wilbur et al., 2016).

3.3.4.2 Treatment Fidelity

Fidelity of intervention delivery was reported in 13 studies (Ard et al., 2017; Befort et al., 2008; Bennett et al., 2022; Cahill et al., 2018; Haire-Joshu et al., 2019; Herring et al., 2016; Hollis et al., 2008; Martin et al., 2006, 2008; McNabb et al., 1997; Sheppard et al., 2016; West et al., 2019; Wilbur et al., 2016). In one study (Befort et al., 2008), a Motivational Interviewing Skills Code checklist was utilised to assess the degree to which counsellors conformed to the principles of MI (Stolley et al., 2017). Another study used an annual certification of site interviewers (West

et al., 2019). Eight studies reported supervision of trainers to assure satisfactory completion of session contents (Ard et al., 2017; Bennett et al., 2013; Cahill et al., 2018; Haire-Joshu et al., 2019; Hollis et al., 2008; Martin et al., 2006, 2008; McNabb et al., 1997). Four studies referred to the review of audio recordings or calls (Befort et al., 2008; Cahill et al., 2018; Haire-Joshu et al., 2019; Sheppard et al., 2016). Others used retraining of interventionist (Bennett et al., 2022), role play retraining (Herring et al., 2016) and the Breitenstein fidelity checklist (Wilbur et al., 2016)

3.3.4.3 Behavioural Change Techniques

Five studies (Befort et al., 2008; Chung et al., 2016; McNabb et al., 1997; Weerts & Amoran, 2011; West et al., 2019) did not mention any theories of behaviour change used in the development of intervention. Of studies that reported theoretical underpinnings, the most common was the Social Cognitive Theory (SCT) (n=14) (Ard et al., 2017; Bennett et al., 2013; Cahill et al., 2018; Fitzgibbon et al., 2005; Haire-Joshu et al., 2019; Herring et al., 2016; Hollis et al., 2008; Liu, Wilcox, et al., 2015; Martin et al., 2006, 2008; Stolley et al., 2009; West et al., 2007; Wilbur et al., 2016; Yanek et al., 2001). Others included the Transtheoretical Model of Behavioural change (n = 2) (TTM) (Hollis et al., 2008; Martin et al., 2006, 2008), Theory of Planned Behaviour (TPB) (n = 1) (Sheppard et al., 2016) and the SEM (n = 2) (Herring et al., 2016; Stolley et al., 2017). A variety of behavioural change techniques were present in all interventions. Data revealed the use of 10 unique BCTs across a total of 12 studies with an average of approximately 5 BCTs incorporated in each study. The majority of studies utilised goal setting (n = 12) (Ard et al., 2017; Befort et al., 2008; Bennett et al., 2013; Cahill et al., 2018; Haire-Joshu et al., 2019; Herring et al., 2016; Liu, Wilcox, et al., 2015; Martin et al., 2006, 2008; McNabb et al., 1997; West et al., 2007; Yanek et al., 2001), self-efficacy (n = 13) (Befort et

al., 2008; Bennett et al., 2013; Chung et al., 2016; Herring et al., 2016; Liu, Wilcox, et al., 2015; Lutes et al., 2017; Martin et al., 2006, 2008; Sheppard et al., 2016; Stolley et al., 2017; West et al., 2019; Yanek et al., 2001) and social support (n = 11)(Ard et al., 2017; Befort et al., 2008; Bennett et al., 2013; Fitzgibbon et al., 2005; Haire-Joshu et al., 2019; Liu, Wilcox, et al., 2015; Lutes et al., 2017; Martin et al., 2006, 2008; Stolley et al., 2017; Stolley et al., 2009; West et al., 2019). Others included self-motivation (readiness to change) (n = 6) (Befort et al., 2008; Bennett et al., 2013; Herring et al., 2016; Martin et al., 2006, 2008; Sheppard et al., 2016), self-monitoring of behaviours (n = 11) (Ard et al., 2017; Befort et al., 2008; Bennett et al., 2013; Cahill et al., 2018; Fitzgibbon et al., 2005; Haire-Joshu et al., 2019; Hollis et al., 2008; Liu, Wilcox, et al., 2015; Lutes et al., 2017; Weerts & Amoran, 2011; West et al., 2007), problem solving (n = 9) (Ard et al., 2017; Bennett et al., 2013; Hollis et al., 2008; Liu, Wilcox, et al., 2015; McNabb et al., 1997; Stolley et al., 2009; West et al., 2007, 2019; Wilbur et al., 2016), considerations of high-risk situations or barriers to change (n=6) (Cahill et al., 2018; Chung et al., 2016; Haire-Joshu et al., 2019; Liu, Wilcox, et al., 2015; Sheppard et al., 2016; Weerts & Amoran, 2011), considerations of ‘pros and cons’ (n=3) (Befort et al., 2008; Liu, Wilcox, et al., 2015; West et al., 2019), reinforcement (n=5) (Cahill et al., 2018; Haire-Joshu et al., 2019; Liu, Wilcox, et al., 2015; Martin et al., 2006, 2008) and role modelling (n=1) (Sheppard et al., 2016). It was observed that interventions utilising a combination of more than three BCTs were more frequently associated with weight loss (n=11) (Befort et al., 2008; Bennett et al., 2013; Fitzgibbon et al., 2005; Haire-Joshu et al., 2019; Hollis et al., 2008; Liu, Wilcox, et al., 2015; McNabb et al., 1997; Stolley et al., 2017; Stolley et al., 2009; West et al., 2007, 2019).

3.3.4.4 Cultural Adaptations

An analysis of cultural adaptation strategies across the interventions identified about nine distinct strategies utilised in 11 studies. On average, each study incorporated approximately 3 distinct cultural adaptation strategies. These included constituent involvement (n=6) (Fitzgibbon et al., 2005; Liu, Wilcox, et al., 2015; Lutes et al., 2017; McNabb et al., 1997; Stolley et al., 2017; Wilbur et al., 2016), in-depth interviews with participants to learn about barriers and enablers of healthy eating and physical activity as well as preferred intervention channels and components (n=1) (Liu, Wilcox, et al., 2015), engagement of community leaders as peer mentors (n=1) (Befort et al., 2008), use of multi-ethnic personnel at intervention sites (n=2) (Lutes et al., 2017; West et al., 2019), use of themes and contents relevant to participants and social contexts (n=6) (Ard et al., 2017; Fitzgibbon et al., 2005; Herring et al., 2016; Hollis et al., 2008; Sheppard et al., 2016; Stolley et al., 2017). Addressing cultural and dietary preferences were utilised in seven studies (Befort et al., 2008; Chung et al., 2016; Fitzgibbon, Stolley, Ganschow, et al., 2005; Hollis et al., 2008; Martin et al., 2008; Stolley et al., 2009; Weerts & Amoran, 2011), others included values placed on faith and religion (n=2) (Sheppard et al., 2016; Stolley, Sharp, et al., 2009), socioeconomic factors (n=6) (Befort et al., 2008; Haire-Joshu et al., 2019; Martin et al., 2006, 2008; Weerts & Amoran, 2011; Wilbur et al., 2016), and perception of body images (n=3) (Befort et al., 2008; McNabb et al., 1997; Sheppard et al., 2016). Two studies (Bennett et al., 2013; Yanek et al., 2001) did not provide any information about cultural tailoring of intervention. Nine studies used a combination of at least two cultural strategies (Ard et al., 2017; Befort et al., 2008; Fitzgibbon et al., 2005; Hollis et al., 2008; Lutes et al., 2017; Martin et al., 2006; McNabb et al., 1997; Sheppard et al., 2016; Stolley et al., 2017).

3.3.4.5 Treatment Adherence

In the studies that reported adherence, treatment adherence was defined as the extent to which participants followed the prescribed intervention protocols, which could include attending scheduled sessions and following behavioural guidelines. Treatment acceptance encompassed participants' willingness to engage with the intervention and their overall satisfaction with the counselling process. To promote treatment adherence, six studies reported use of financial incentives (Herring et al., 2016; Liu, Wilcox, et al., 2015; Martin et al., 2006, 2008; Weerts & Amoran, 2011; Wilbur et al., 2016), ranging from \$25 to \$45. Additionally, the provision of vouchers for fresh fruits and vegetables (n=1) (Weerts & Amoran, 2011) was shown to encourage healthy eating habits. The treatment adherence rates varied among the nine studies that reported on it. Among nine studies that reported treatment adherence rates, two reported <50% adherence (Befort et al., 2008; Wilbur et al., 2016), and seven studies reported adherence >60% (Ard et al., 2017; Bennett et al., 2013; Herring et al., 2016; Sheppard et al., 2016; West et al., 2007, 2019; Yanek et al., 2001). Intervention acceptability rates, reported in four studies were >70% (Befort et al., 2008; Herring et al., 2016; Liu, Wilcox, et al., 2015; Sheppard et al., 2016). Factors that influenced adherence to and acceptance of treatment included the level of social support provided (n=1) (Befort et al., 2008), cultural sensitivity of interventions (n=2) (Befort et al., 2008; Herring et al., 2016), intensity as well as individual participant characteristics (n=1) (Liu, Wilcox, et al., 2015; Sheppard et al., 2016). Studies that utilised more intensive interventions such as frequent counselling sessions, personalised feedback or social support typically resulted in higher adherence rates (n=7) (Ard et al., 2017; Bennett et al., 2013; Herring et al., 2016; Sheppard et al., 2016; West et al., 2007, 2019; Yanek et al., 2001). See Table 3.2 for summary of study interventions.

Table 3.2. Summary of client-centred counselling interventions design and main outcomes in Black African women with overweight and obesity

Study	Study design	Study intervention	Theory based*	Duration of intervention (counselling)	Length of follow up	Main health outcome(s)	Main intervention effects
McNabb et al. (1997)	RCT	Treatment: culturally tailored PATHWAYS program, n=19. Control: waitlist, n=20	No information	small group sessions were held weekly for 14 weeks in churches for 1.5hrs.	14 weeks	Body weight, BMI, Waist circumference, Weight loss behaviour index	Significant difference in weight loss between the intervention group (5% loss, -10 lb) and control group (1% gain, +1.9 lb) ($p < 0.0001$). BMI decreased by 1.4 in the intervention group and increased by 0.6 in controls ($p < 0.0001$). High-fat food intake decreased in the intervention group and increased in controls ($p < 0.05$). No differences in physical activity were observed.
Yanek et al. (2001)	RCT	Treatment: Standard behavioural intervention- held weekly sessions on nutrition and physical in churches, n=188. Spiritual intervention- Standard intervention plus spiritual components, n= 267. Control: Self-help intervention: materials from the American Heart	SCT-Self efficacy	Weekly 30-45mins in-person sessions held over 20 weeks	12 months	Body weight, BMI, Blood Pressure and heart rate, Blood lipids and glucose levels, Dietary intake, Physical Activity	From baseline to 12-month follow up, weight change (lb) in treatment groups was larger (-1.1 ± 0.42) compared to control group (0.83 ± 0.52), $P=0.0008$. Similar for BMI in treatment group (-0.17 ± 0.07) vs 0.14 ± 0.09 , $P=0.0012$. Significant differences between groups in energy intake -117 kcal, $P=0.0038$, waist circumference -0.66inches, $P=0.0047$

		Association on healthy eating and physical activity, n=74					
Fitzgibbon et al. (2005)	RCT	Treatment: Faith on the Move. Faith-Based Weight Loss Intervention: Culturally Tailored Weight Loss Intervention with addition of scriptures, n=30. vs Culturally Tailored Weight Loss Intervention, n=29	SCT	Twice weekly for 12 weeks. First weekly meetings lasted 90 minutes (45 minutes for didactic and 45 minutes for exercise); second weekly meetings consisted of a 45-minute exercise session.	12 weeks	Body weight change (kg), BMI, Dietary fat, Physical Activity	The intervention group showed significant weight loss (2.6 kg) and BMI reduction (1.0) from baseline to 12 weeks ($P<0.005$), but no significant differences compared to the control. Significant increase in Total energy expenditure and energy expended. No significant difference in fat consumption.
Martin et al. (2006)	RCT	Control: Usual physician obesity management during regular medical care (n = 73) Treatment: Culturally tailored, physician-directed recommendations based on participants' current eating practices and physical activity levels (n = 71)	SCT, TTM	15-minute individual sessions over 6 months.	6 months	Body weight, BMI. Physical activity, psychosocial variables; depression, minor life stress and self-efficacy for eating behaviors.	Between baseline and 6 months, the intervention group demonstrated weight loss (mean= -2.0 kg $\pm$ 3.2) that differed significantly, $p=0.03$ from the standard care group (mean=+0.2kg $\pm$ 2.9). A greater percentage of intervention participants lost weight by month 6 (79%) compared with standard care participants (47%).

West et al (2007)	RCT	Treatment group (n=109) received individual sessions of motivational interviewing as an adjunct to a group-based behavioural weight control program; attention control group (n=108) received individual health education.	SCT	42-session weight management program: weekly for 6 months, biweekly for 6 months, and monthly for 6 months. Emphasis on weight loss in the first 6 months and weight maintenance in the following 12 months. Five individual motivational interviewing sessions (approximately 45 minutes each) were delivered by licensed clinical psychologists.	18 months	Body weight, BMI, Glycemic control	Significant weight loss at 6 months ($P < 0.0007$) and 12 months ($P = 0.008$). Weight regained by 18 months,

Befort et al. (2008)	RCT	Control: Health education on non-weight loss topics (n = 23) Treatment: Culturally-targeted behavioural weight loss program with motivational interviewing (MI) sessions (n = 21)	No information	Four 30-minute MI sessions over 16 weeks (weeks 0, 3, 8, and 13) delivered by a doctoral clinical psychology student.	16 weeks	Body weight and BMI, Dietary intake, Physical activity, Psychosocial factors (motivation, diet self-efficacy, exercise self-efficacy)	Post treatment, treatment group lost weight in kg - 2.6 ± 4.2 and BMI -1.0 ± 1.5 . No significant change in physical activity. significant decrease in daily kcal and percent kcal from fat. Significant increase in fruit and vegetables servings per day. No significant differences between treatment and control group
Martin et al. (2008)	RCT	Treatment: Culturally tailored weight loss and weight maintenance intervention. Physician-patient counselling with incentives, n=68. Control: Usual care, n=69; regular medical care with no weight loss instructions.	SCT	Five sessions of 15 minutes each monthly for 5 months, plus 1 weight maintenance session at month 6, totalling 90 minutes of physician-patient contact.	6months for weight loss and 18 months for weight maintenance	BMI, Physical activity, Dietary intake, Psychosocial variables (depression, major life stress, life experience, minor life stress, self efficacy for eating behaviours)	From baseline to 6-month follow up, treatment lost $1.4\text{kg} > \text{CT}$ ($p < 0.05$). Treatment group more successful in weight maintenance from baseline: At 9 months, treatment lost more weight than control ($-1.53 \pm 3.72\text{kg}$ vs $+0.61 \pm 3.37\text{kg}$, $p = 0.01$) At 12 months, $-1.38 \pm 3.69\text{kg}$ vs $-0.16 \pm 3.63\text{kg}$, $p = 0.10$ At 18 months, $-0.49 \pm 3.33\text{kg}$ vs $+0.07 \pm 3.75\text{kg}$, $p = 0.39$
Hollis et al. (2008)	RCT	Treatment: culturally tailored weight loss maintenance trial, n=1685 (540 African American women)	SCT, techniques of behavioural self-	20 weekly group weight-loss sessions over 6 months. 90–120 minutes long with about	6 months	Weight change (kg), BMI change, Physical Activity, Fruit	The mean differences in weight change post intervention were -4.1 kg (SD 2.9), BMI change was -1.5 (SD 1.2), and fruit and

			management, TTM	18–25 participants per group. Occasional phone contacts		and vegetable servings/day	vegetable servings per day increased by 2.1 (SD 2.3).
Weerts & Amoran. (2011)	RCT	Treatment: personalised nutritional counselling at four appointments plus \$40 gift card to purchase fruits and vegetables n(=10) Control: received \$40 gift card to purchase groceries (n = 11)	No information	15 minutes monthly individual sessions over 3 months by a well-known African American woman	3 months	Body weight, BMI, waist-to-hip ratio, caloric and nutrient intake	At month1: experimental n=4 lost 2.85 lb body weight > control n=5, +2.00 lb (p=0.002) At month 2: experimental n=4 lost 1.90 lb body weigh> control n=5, +3.68 lb (p=0.022) At month 3: experimental n=4 lost 6.05 lb body weight> control n=5, +3.68 lb (p=0.008). No significant reduction in calories (kcal), increased fruits and vegetable intake (cups) between treatment and control groups

Bennett et al. (2013)	RCT	Treatment, n=97: interactive obesity treatment approach (iOTA) and mutually reinforcing components: tailored behaviour change goals, weekly self-monitoring via interactive voice response, 12 counselling calls, tailored skills training materials and a 12-month YMCA membership. Control n=97, usual care	SCT-self efficacy	20-minutes counselling calls monthly over 12 months, by registered dietitians	18 months	Primary outcomes were change in weight and BMI at 12 months. Weight maintenance at 18 months Secondary measures: waist circumference, blood pressure, and fasting glucose, triglyceride, and cholesterol levels	From baseline to 12-month follow up, weight change (kg) in treatment group was larger (-1.0 ± 0.5) relative to usual care (0.5 ± 0.5); mean difference -1.4kg , $p=0.04$. At 18 months, weight changes were maintained. Intervention group lost 0.9kg compared to control group, $+0.8\text{kg}$, $p=0.03$. No differences between groups in change in waist circumference, blood pressure control, glucose or lipid levels.
West et al. (2019)	RCT	3-phased lifestyle intervention modelled after the diabetes prevention program (DPP). Treatment: Look AHEAD (Action for Health in Diabetes), n= 303	No information	Phase 1: Months 1-6: weekly on-site visits; 3 group and 1 individual session Months 7-12: 3 per month on-site visits; 2 group, 1 individual session Phase 2: Years 2-4: minimum of 1 per month on-	13.5 years	Body weight change calculated in kg and %. % of individuals achieving $>5\%$ and $>10\%$ weight loss. Physical activity	In treatment group (Black African-American women, n=303), weight loss trajectories followed a similar pattern in percent weight change and weight change in kg from baseline- Highest weight losses at Year 1: $-6.7\text{kg} \pm 0.3$ and -6.8% ± 0.3 . At year 4 some regain was observed ($-4.4\text{kg} \pm 0.5$ and $-4.3\% \pm 0.5$) however, approximately half of respondents sustained weight loss at year- 8 ($-6.5\text{kg} \pm 0.6$ and $-6.3\% \pm 0.6$).

				site visit; 1 individual with minimum of 1 additional contact by phone or mail Phase 3: Years 5+: monthly on-site visits; individual sessions			
Herring et al. (2016)	RCT	Treatment: Technology-based behavioural intervention (n = 33); Control: usual obstetrical care (n = 33).	SCT, SEM	15-20 minute counselling calls for the treatment group: weekly for the first 2 weeks, then twice monthly thereafter.	until delivery	% of women with excessive gestational weight gain	Intervention group were less likely to exceed IOM guidelines compared to usual care (37% vs. 66%, p=0.033). Similar results were observed in analyses adjusted for early pregnancy BMI, p=0.0497). Intervention participants also gained less weight in pregnancy than controls (8.7 vs. 12.3 kg, respectively, p=0.046). No group differences found for neonatal and obstetric outcomes
Sheppard et al. (2016)	RCT	Treatment: Stepping Stone intervention, n= 15; control (usual care), n = 16	TPB, SCT	Every two weeks of 90-minute group sessions (30 minutes of supervised physical activity and 60	12 weeks	Body weight, waist/hip ratio, BMI, dietary intake, Physical activity, Cardiovascular fitness (VO ² max)	The intervention group only lost 0.8% of their total bodyweight, less than expected 5% weight loss goal. Tendency for lower bodyweight, body mass index, and lower waist/hip

				minutes of education) and 6 individual phone sessions of motivational interviewing (15 minutes each) every other week by an exercise physiologist and a nutritionist.			ratio in the intervention group (mean change = -1.7, -0.3, -0.03, respectively). Change was greatest for vigorous activity in the intervention group compared to lower levels of activity. Total physical activity levels increased in the intervention group 3.6-fold when compared to the control group (+3501.1 MET min/week vs. +965.3 MET min/week, respectively). Reduced energy intake, fat intake and % energy from fat in intervention group
Wilbur et al. (2016)	RCT	The Women's Lifestyle Physical Activity Program plus MI. Group discussion only, n=95, Group discussion + Personal Motivational Telephone Calls, n=96, Group discussion+ Automated Motivational Telephone Calls, n=97	SCT	Six 2-hour group meetings delivered over 48 weeks with either 11 personal motivational calls, 11 automated motivational messages, or no calls between meetings.	48 weeks	Physical Activity, Body weight, BMI, Waist circumference	No significant changes in Weight and body composition between groups, P>0.05

Lutes et al. (2017)	RCT	Treatment: behaviourally-centred and culturally-relevant lifestyle coaching intervention, (n=100) Control group (n=100) received standard care.	small changes model of behaviour change	12 months with 16 individual contacts: first two sessions face-to-face, followed by 14 sessions either face-to-face or via telephone (20-30 minutes each) delivered by trained African American CHWs.	12 months	Primary outcomes were HbA1c Secondary outcomes: weight, and BP, psychosocial outcome measures (self-reported empowerment and medication adherence)	Participants in the small Changes group had modest but significantly greater weight loss (21.3566.22 vs. 20.3964.57 kg; P50.046) compared to the mail-based education group across 12 months.
Stolley et al. (2017)	RCT	Culturally sensitive intervention. Treatment group (n=125) participated in the 6-month Moving Forward Interventionist-Guided program (MFG); control group (n=121) received the Moving Forward Self-Guided program (SG).	SEM	MFG included twice-weekly in-person classes (90 minutes and 60 minutes) and twice-weekly text messaging.	12 months	Weight (kg), Waist circumference, Physical Activity, Dietary intake	Between groups, MFG demonstrated significantly greater improvements than SG for weight and percentage of weight loss (23.49 kg v 21.27 kg; P <0.001; 3.6% v 1.4%, respectively), waist circumference (23.31 cm v 21.37 cm; P = .028) at 6 months. and for weight (22.70 kg v 21.57 kg; P <0.05) at 12months. In terms of clinically meaningful weight losses, 68.2% of MFG participants lost ~3% compared with 44.4% of SG; 44.3% of MFG and

							19% of SG lost ~5% (P <0.05).
Ard et al. (2017)	RCT	Treatment: culturally tailored behavioural weight loss program augmented with community strategies, n=255. vs weight loss only, n=154	SCT	Weekly group sessions of 1.5hr each were delivered consecutively for 6 months, followed by a 6-month follow-up period (3 months bi-monthly sessions followed by 3 months of monthly sessions). Follow-up phone calls of 10–20 minutes monthly.	6 months	Body weight, BMI, Waist circumference, Blood Pressure, Dietary intake	57.1% of Weight Loss Only participants and 60.4% of Weight Loss Plus participants experienced weight loss, with no significant difference between groups. At the 5% weight loss target, 23% of the total sample met this goal, with no differences by treatment assignment.

Cahill et al. (2018)	RCT	Treatment Group (PAT+): n=133, received standard Parents as Teachers (PAT) education plus lifestyle weight management counselling focused on diet and physical activity. This included goal setting for appropriate gestational weight gain (GWG), self-assessments, and positive reinforcement. Control Group: n=134, received the standard PAT curriculum emphasizing development-centred parenting support.	SCT	10 biweekly home visits during pregnancy, with 1-hour sessions led by parent educators.	until delivery	Primary outcome: % exceeding IOM GWG for overweight and obesity. Secondary outcomes: weekly GWG and changes from week 15 to 35; body fat and fat-free masses; glycemic control; plasma lipid profile; systolic and diastolic blood pressures	PAT+ group gained less weekly (0.4kg vs 0.5kg/wk, p=0.04) and total weight (8.0kg vs 9.6kg, p=0.02). PAT+ group had lesser excessive GWG (36.1% vs 45.9%) but not statistically significant, p=0.11.
Haire-Joshu et al. (2019)	RCT	Treatment: PAT+ lifestyle, n=133; included standard PAT education plus lifestyle counselling on diet and physical activity (goal setting, reinforcement of positive behaviours). Control: Standard PAT curriculum, n=134; focused on	SCT	Home visits every other week during pregnancy and monthly for 12 months postpartum.	12 months after parturition	Primary outcome: body weight change from baseline to 12 months postpartum. Secondary outcome: % of women returning to baseline weight, % of	PAT+lifestyle group gained less weight than standard PAT (2.5kg vs 5.7kg, p=0.01) and were more likely to return to baseline weight (38.0% vs 21.5%, p=0.001)

		development-centred parenting support and education.				women with GWG (baseline to 36weeks)>IOM weight guidelines	
Stolley et al (2009)	Pre-post Longitudinal study	A culturally relevant intervention incorporating weekly Focus Group Discussions on food, family, music, social roles and relationships, and spirituality/religion. Treatment n=23	SCT, Health belief model	6 months of weekly sessions	6 months	Body weight, BMI, Food intake, Physical Activity, Social support and quality of life	Post-intervention there were: Sig reductions in weight (-5.57lb) and BMI (-1.00kg/m ²) post intervention., p=0.001 Sig increase in veg consumption (1.6 servings per day) and fiber (3.8g per 1000 kcal), p=0.001 Sig reduction in total daily fat (23.6g) No change in TEI, sodium consumptions or servings fruit per day.
Liu et al. (2015)	Pre-post Longitudinal study	Pilot culturally tailored lifestyle intervention (based on formative research) on nutrition and physical activity Mixed individual and group counselling sessions and with telephone counselling	SCT	Treatment in pregnancy, n=16: individual counselling session followed by 8 90-min group sessions with telephone	32 weeks 12 weeks postpartum	GWG, Postpartum weight retention, Physical activity, Dietary intake	Compared to contemporary controls, study participants gained less total weight on average (mean GWG 24.9±13.3 vs 26.2±17.6, p=0.23) and were less likely to exceed GWG recommendations (56.3% vs 63.2%).

				counselling contacts by registered dieticians Treatment postpartum at 6 to 8 weeks: individual home visits and 3 counselling telephone calls through to week 12 postpartum.			At 12 weeks postpartum, intervention participants retained 2.6 lbs from their pre-pregnancy weight. No significant change in PA during pregnancy. Increased PA postpartum, $p=0.06$. Significant increase in total daily energy expenditure at 32 weeks from baseline ($p=0.03$) and postpartum ($p=0.008$) Total caloric intake declined across time.
Chung et al. (2016)	Pre-post Longitudinal study	Treatment: mixed Individual and group dietary counselling incorporating mindful eating and reinforcement of healthy eating, $n=26$	No information	12 weeks, with bi-weekly sessions.	6 months	Body weight change, BMI, Mindful eating scores	From baseline to 6 months, weight and BMI significantly decreased over time, $p=0.015$ and $p=0.014$, respectively. Significant increase in MEQ scores overtime, $p=0.001$.

*SCT=Social cognitive theory; TTM=Transtheoretical model of behavioural change; SEM= Socioecological model; TPB= Theory of planned behaviour

3.3.5 Outcome Measurements

3.3.5.1 *Effect of Client-Centred Counselling on Primary Outcomes*

Included papers reported post-intervention bodyweight outcomes as change in kilograms (kg) (Bennett et al., 2013; Cahill et al., 2018; Haire-Joshu et al., 2019; Herring et al., 2016; Liu, Wilcox, et al., 2015; Lutes et al., 2017; Martin et al., 2006, 2008; Stolley et al., 2017; West et al., 2019), change in pounds (lb) (McNabb et al., 1997; Weerts & Amoran, 2011; Yanek et al., 2001), percent weight loss (%) (Ard et al., 2017; Sheppard et al., 2016) or change in BMI (Chung et al., 2016).

Between 1 and 6 months post-intervention follow-up, 10 studies (Ard et al., 2017; Befort et al., 2008; Chung et al., 2016; Fitzgibbon et al., 2005; Hollis et al., 2008; Martin et al., 2006, 2008; McNabb et al., 1997; Sheppard et al., 2016; Stolley et al., 2009; Weerts & Amoran, 2011) reported effects on weight loss, with statistically significant effects. Ten studies (Bennett et al., 2013; Cahill et al., 2018; Herring et al., 2016; Liu, Wilcox, et al., 2015; Lutes et al., 2017; Stolley et al., 2017; West et al., 2007, 2019; Wilbur et al., 2016; Yanek et al., 2001) reported intervention effects between 8 and 12 months of follow-up after the intervention period, also demonstrating statistically significant effects. Overall, 91% (n=20) of the studies revealed within-group effects on weight loss ($p<0.05$), whereas 93% (n=14) of the 15 studies with control groups showed statistically significant between-group intervention effects (Bennett et al., 2013; Cahill et al., 2018; Haire-Joshu et al., 2019; Herring et al., 2016; Liu, Wilcox, et al., 2015; Lutes et al., 2017; Martin et al., 2006, 2008; McNabb et al., 1997; Sheppard et al., 2016; Stolley et al., 2017; Weerts & Amoran, 2011; West et al., 2019; Yanek et al., 2001).

Client-centred counselling was only found to be effective in two out of five studies (Bennett et al., 2013; Haire-Joshu et al., 2019) (both of which used individual-based formats) in promoting weight maintenance over 12-months of post-intervention follow-up.

3.3.5.2 Effect of Client-Centred Counselling on Secondary Outcomes

In addition to investigating body weight outcomes, lifestyle modifications, including physical activity and dietary intake, were also examined. Dietary intake was evaluated in terms of participants' total energy intake, fat and salt intake, as well as fruit and vegetable intake. Physical activity was measured using self-reported questionnaires in seven studies (Ard et al., 2017; Befort et al., 2008; Fitzgibbon et al., 2005; Martin et al., 2006, 2008; Sheppard et al., 2016; West et al., 2019) and accelerometry in three studies (Hollis et al., 2008; Liu, Wilcox, et al., 2015; Wilbur et al., 2016). Of these, six studies (60%) (Ard et al., 2017; Fitzgibbon et al., 2005; Martin et al., 2006, 2008; Sheppard et al., 2016; Wilbur et al., 2016) reported significant improvements in physical activity outcomes within the intervention groups. Regarding dietary intake, eight out of ten studies (80%) (Befort et al., 2008; Hollis et al., 2008; Liu, Wilcox, et al., 2015; Martin et al., 2008; McNabb et al., 1997; Sheppard et al., 2016; Stolley et al., 2009; Yanek et al., 2001) showed improvements in dietary habits within the intervention groups. Table 3.2 reports findings of lifestyle outcomes.

3.3.6 Risk of Bias

A summary of quality appraisal for RCTs is provided in Table 3.3. In terms of overall ratings, there was variability in risk of bias across studies. Of the 19 RCTs evaluated using the RoB 2 tool, 15 had low risk of bias (Ard et al., 2017; Cahill et al., 2018; Fitzgibbon, Stolley, Ganschow, et al., 2005; Haire-Joshu et al., 2019; Herring et al., 2016; Hollis et al., 2008; Lutes et al., 2017; Martin et al., 2006, 2008; McNabb et al., 1997; Stolley et al., 2017; West et al., 2007, 2019;

Wilbur et al., 2016; Yanek et al., 2001) two some concerns (Befort et al., 2008; Sheppard et al., 2016) and two had high risk of bias (Bennett et al., 2013; Weerts & Amoran, 2011). All three non-RCTs evaluated using the ROBINS-1 tool had a low risk of bias (Chung et al., 2016; Martin et al., 2006; Stolley, Sharp, et al., 2009) (Table 3.4). In RCTs with a high risk of bias, the source of bias differed across domains: bias resulting from randomization and bias resulting from deviations from intended interventions (Bennett et al., 2013; Weerts & Amoran, 2011)

Table 3.3. Risk of Bias in Randomized Control trials (RoB 2) (n=19)

	Domain 1	Domain 2	Domain 3	Domain 4	Domain 5	
Author	Risk of bias arising from randomisation process	Risk of bias due to deviations from intended intervention	Risk of bias due to missing outcome data	Risk of bias in measurement of outcome	Risk of bias in selection of the reported result	Overall risk of bias judgement
McNabb et al. (1997)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Yanek et al. (2001)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Fitzgibbon et al. (2005)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Martin et al. (2006)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
West et al (2007)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Befort et al. (2008)	Some concerns	Low risk	Low risk	Low risk	Low risk	Some concerns
Martin et al. (2008)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Hollis et al. (2008)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Weerts & Amoran. (2011)	Some concerns	Some concerns	Low risk	Low risk	Low risk	High risk
Bennett et al. (2013)	High risk	Low risk	Low risk	Low risk	Low risk	High risk
West et al. (2019)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Herring et al. (2016)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Sheppard et al. (2016)	Some concerns	Low risk	Low risk	Low risk	Low risk	Some concerns
Wilbur et al. (2016)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk

Lutes et al. (2017)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Stolley et al. (2017)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Ard et al. (2017)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Cahill et al. (2018)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Haire-Joshu et al. (2019)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk

Table 3.4. Risk Of Bias in Non-randomized studies – of Interventions (ROBINS-I) (n=3)

Bias Domain	Stolley et al. (2009)	Liu et al. (2015)	Chung et al. (2016)
Bias due to confounding	Low	Low	Low
Bias in selection of participants	Low	Low	Low
Bias in classification of interventions	Low	Low	Low
Bias due to deviations from intended interventions	Low	Low	Low
Bias due to missing data	Low	Low	Low
Bias in measurement of outcomes	Low	Low	Low
Bias in selection of the reported result	Low	Low	Low
Overall risk of Bias judgement	Low	Low	Low

3.4 Discussion

The findings from this systematic review, one of the first to evaluate the effectiveness of client-centred counselling for weight management among Black African women with overweight and obesity in high-income countries, provide valuable insights into the efficacy of such interventions. The evidence demonstrates that client-centred counselling, particularly when culturally tailored and grounded in BCTs, results in meaningful weight loss.

The positive outcomes in weight loss seen across 93% of the studies reviewed highlight the potential for client-centred counselling to address obesity in Black African women—a population where health disparities are often pronounced (HSE, 2019). The 5% weight loss achieved by participants as a result of treatment in 75% of the studies is especially noteworthy, as it represents the threshold for clinically meaningful weight reduction according to established obesity guidelines (Blackburn, 1995; Williamson et al., 2015). This result mirrors findings from

studies on African American populations, where behavioural interventions have also led to notable weight loss (Fitzgibbon et al., 2012; Tussing-Humphreys et al., 2013). In the systematic review by Fitzgibbon et al. (2012), larger, multi-site trials involving medically at-risk African American women achieved greater weight loss compared to smaller, single-site, or non-randomised trials, which often lacked the power or intensity to detect significant changes. Likewise, the present study's findings are comparable to those found by previous systematic reviews and meta-analysis (Armstrong et al., 2011; Barnes & Ivezaj, 2015) that looked at client-centred intervention effects on weight loss among adults of different ethnicities with overweight and obesity, with approximately one-third and 6% to 35.7% of participants achieving a clinically significant threshold of at least 5% weight loss. So too, the systematic review (Patel et al., 2019) which evaluated the efficacy of MI delivered via eHealth and telehealth strategies among adults with overweight and obesity also reported evidence on the effectiveness of client-centred counselling in achieving weight loss in ~55% of included studies.

One critical aspect emerging from this review is the importance of cultural relevance in intervention design. The integration of cultural elements such as dietary preferences, religious considerations, and community involvement was a common feature of successful interventions, aligning with previous research that emphasises the importance of culturally tailored interventions in promoting behaviour change among ethnic minorities (Kumanyika, 2019; Lancaster et al., 2014). However, beyond confirming the effectiveness of these adaptations, the findings raise questions about how best to incorporate these cultural elements without reinforcing stereotypes or limiting the flexibility of the intervention. For instance, the inclusion of community-based components may foster social support but may not fully address individual barriers related to socioeconomic status or access to healthcare services. As such this underscores

the complexity of developing interventions that are not only culturally sensitive but also adaptable to diverse individual needs (LeBlanc et al., 2018; Resnicow et al., 1999).

Theories such as SCT (Bandura, 1986) and the TTM of Behavioural Change (Sutton, 1997) underpin many of the client-centred interventions reviewed. These theories focus on enhancing self-efficacy, motivation, and personal accountability, and appear particularly effective in promoting weight loss, especially when combined with practical strategies like goal setting and self-monitoring. Theories of behaviour change suggest that sustained weight loss is more likely when individuals feel empowered to make autonomous decisions, supported by counsellors who adopt a non-directive, empathetic approach (Hardcastle et al., 2017; Lancaster et al., 2014). This aligns with the present study's observation that several effective interventions employed one-to-one formats. Although both one-to-one and group formats showed benefits, the potential greater effectiveness of individual delivery should be interpreted with caution, as no direct comparison was conducted. The question of whether individual or group interventions are more appropriate for different stages of behaviour change remains open, though current findings suggest there may be context-specific advantages to each (Kong et al., 2014; Michie et al., 2014).

The issue of intervention duration also warrants careful consideration. Interestingly, interventions lasting less than six months appeared more likely to achieve significant weight loss outcomes compared to those of longer duration. This pattern may reflect the phenomenon of "diminishing returns," where initial motivation and engagement are high, but participants experience a plateau in weight loss over time (Wing & Phelan, 2005). This is further corroborated by other studies (Armstrong et al., 2011; Barnes & Ivezaj, 2015) that found better weight loss outcomes within six months, whereas longer-term interventions did not seem to offer weight loss benefits.

Moreover, obesity treatment guidelines for lifestyle interventions recommend a minimum of six

months of treatment and with at least 14 contacts with clinicians (Jensen et al., 2014). From a behavioural perspective, shorter, more intensive interventions could be more effective for initiating weight loss, while longer-term strategies are needed to sustain it. However, this present review also highlights a gap in the literature regarding long-term follow-up, with only 40% of studies including assessments beyond 12 months. This is consistent with findings from Tussing-Humphreys and colleagues (Tussing-Humphreys et al., 2013), who noted limited long-term success in maintaining weight loss. In their study, African American women lost less weight during the intensive weight loss phase and maintained a lower percent of their weight loss compared to Caucasian women in the behavioural lifestyle interventions reviewed, underscoring the need for ongoing support or periodic "booster" sessions.

In terms of delivery methods, face-to-face counselling, whether conducted alone or in combination with telephone follow-ups, emerged as a particularly effective mode of intervention. While digital and remote health strategies are increasingly popular, especially in the wake of the COVID-19 pandemic (Golinelli et al., 2020; Wosik et al., 2020), the present review suggests that in-person interactions may foster stronger relationships between participants and counsellors, improving adherence (Fitzgibbon et al., 2012). This observation is supported by existing literature on therapeutic alliances, which shows that face-to-face interactions can strengthen motivation and trust, key factors in achieving behaviour change (Ardito & Rabellino, 2011; Horvath & Luborsky, 1993). However, given the logistical and financial barriers to frequent in-person counselling, hybrid models that combine digital tools with periodic face-to-face sessions may strike an optimal balance between accessibility and effectiveness.

A critical dimension of the interventions was the incorporation of multiple BCTs. Interventions that employed at least three BCTs, such as self-monitoring, social support and goal setting

appeared more likely to achieve significant weight loss. This is supported by recommendations by Olateju and colleagues 2021) on the use of multiple BCTs to enhance compliance and adherence to study interventions. Moreover, the use of multiple BCTs aligns with established behavioural theories, such as the TPB, which highlights the importance of perceived behavioural control, social influences, and intention formation in driving behaviour change (Ajzen, 1991). The effectiveness of using multiple BCTs points to the need for interventions that are not only comprehensive but also dynamic, capable of adapting to the evolving needs of participants throughout the intervention period. However, our study also reveals a gap in the literature concerning the comparative effectiveness of different BCTs (Lancaster et al., 2014). Future research should explore which specific techniques or combinations of techniques are most effective for this population, as this would allow for the development of more targeted, cost-effective interventions.

The present review also highlights the importance of intervention fidelity and practitioner expertise in determining outcomes. Studies that reported high fidelity, often through the use of trained professionals such as registered dietitians or lifestyle counsellors, were more likely to report positive outcomes. This raises important questions about the scalability of such interventions. While it is clear that expertise and training improve effectiveness (DiLillo & West, 2011), the feasibility of widespread implementation using highly trained specialists may be limited in resource-constrained settings. This highlights the need for future research to explore how non-specialist health workers can be effectively trained to deliver client-centred counselling with high fidelity, particularly in underserved communities (Tussing-Humphreys et al., 2013). There is growing evidence that non-specialists, when appropriately trained and supported, can

achieve outcomes comparable to those of specialists (Oyedeji et al., 2022) making this an important area for future investigation.

Finally, the present review sheds light on the importance of addressing the broader social determinants of health in weight management interventions. Many of the interventions reviewed adopted a socio-ecological approach, recognising that individual behaviour change is influenced by factors such as access to healthy foods, transportation, childcare, and safe environments for physical activity (Burton et al., 2017). This is particularly relevant for Black African women in HICs, who may face intersecting barriers related to race, gender, and socioeconomic status. While many of the interventions successfully integrated strategies to overcome these barriers—such as providing vouchers for healthy food or addressing childcare needs—the persistence of health disparities suggests that broader structural changes are necessary. Interventions that merely focus on individual behaviour change without addressing the systemic issues that contribute to obesity are unlikely to produce sustainable, population-wide effects (Burton et al., 2017). Future research should therefore explore how client-centred counselling can be integrated into broader public health strategies that address the root causes of obesity in marginalised communities.

There are study limitations to consider. Firstly, although the search was rigorous including nine databases, it is possible that the inclusion of other search engines may have populated additional studies. Secondly, searches were restricted to studies available in English, which may have excluded relevant papers and resulted in location bias. Thirdly, all included studies failed to delineate information about participants' countries of origin, migration status, and length of stay in host countries which would have allowed for a more robust evaluation and interpretation of study outcomes in the context of Black African women migrants which was the intended target

population in the present systematic review. Given the aforementioned limitations, we recommend that our study findings be interpreted cautiously. Nonetheless, this present systematic review has several key strengths. This study is a novel attempt to fill a gap in the literature on the use of client-centred counselling on weight management specifically among Black African minority women with overweight and obesity; to the best of the authors knowledge, this is the first study to be conducted among this ethnic group. Thus, the findings of this study can be used to inform the planning and programming of obesity interventions in different settings--primary care, community and through the use of technologies. So too, our findings may be used to inform educational policy and practice in adult settings, as well as to improve the rigour and planning of future research on weight management in overweight and obese Black African women.

There are additional areas of future research that will benefit the field. Quantitative analysis was not performed in this study due to the heterogeneity of study outcomes. It is therefore impossible to draw conclusions based on pooled effect size estimates. In the future, a meta-analysis of intervention effects should be investigated. Given the relatively small number of studies ($n=22$) conducted over the last five decades (1970 to June 2022), it is clear that more interventions using client-centred counselling as a weight loss strategy are required in this population. As previously stated, all studies failed to report participants' countries of origin, ethnicities, migration status, and length of stay in host countries. Future studies should report ethnic breakdowns (and countries of origin) as well as breakdown information of study participants' migratory status. Furthermore, all studies were based in the United States, which could have resulted in location bias. Therefore, more studies from other high-income countries are needed to allow for more robust comparisons of weight loss outcomes. Finally, while efforts to develop more scalable and

accessible obesity treatment interventions for Black African women living in HICs are critical, these should be accompanied by further research focusing on long-term outcomes, including the acceptability, feasibility, and adherence to these interventions. Long-term follow-up studies are particularly needed to ensure that such interventions are sustainable and effective in this population over time.

3.5 Conclusion

This review underscores the potential of client-centred counselling as an effective intervention for weight management among Black African women in HICs. However, it also highlights several gaps in the current evidence base, particularly regarding long-term outcomes, the comparative effectiveness of different BCTs, and the scalability of interventions. While the findings are promising, particularly in terms of short-term weight loss and the cultural relevance of interventions, future research must focus on sustaining these outcomes over time and addressing the broader socioecological factors that influence health behaviours. By doing so, client-centred counselling can become a more effective tool in the fight against obesity and related health disparities in this vulnerable population.

Chapter 4

Thesis study map: Study 2

Study	Objectives
Study 1: Effectiveness of Client-Centred Counselling on Weight Management among Black African Women with Overweight and Obesity in High-Income Countries: A Systematic Review	Objectives: to evaluate the effectiveness of client-centred counselling on weight management in Black African women with overweight and obesity and provide information about: • specific intervention component and skills used • culturally tailored strategies, and theoretical underpinnings
Study 2: Modification and validation of the EPIC FFQ to assess dietary intake in Black African adults	Objectives: • To modify the EPIC FFQ to better reflect the dietary habits, cultural food practices, and food preferences of Black African adults • To validate the modified EPIC FFQ
Study 3: Assessment of Dietary Patterns among Black African Women from sub-Saharan Africa living in the UK	Objectives: • To determine the dietary intake and associated demographic factors • To classify dietary patterns and any associated determinants.
Study 4: A qualitative study exploring factors influencing dietary choices of Black African women with overweight and obesity from Sub-Saharan African living in the UK	Objectives: • With dietary patterns identified from study 3, investigate the factors that influence Black African immigrant women's dietary choices and eating habits.
Study 5: A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women (The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change Wheel	Objectives: • With findings from study 1, 2, 3 and 4, design a nutritional and lifestyle program targeting overweight and obesity among Black African women in the UK

Chapter 4

Study 2: Modification and Validation of The EPIC FFQ To Assess Dietary Intake in Black African Adults

4.1 Introduction

The preceding chapter highlighted the potential of client-centred counselling in the context of weight management, underscoring the significance of tailoring interventions to meet the unique needs of populations. To develop an effective intervention, it is essential to first understand dietary intake and patterns within the target group, as well as to utilise validated tools that effectively assess food practices. This chapter builds upon the established foundation by presenting the findings from Study 2, which focused on modifying and validating the EPIC FFQ for assessing dietary intake among Black African adults living in the UK.

The first section discusses different dietary assessment methods, such as diet records, 24-hour recalls, and biomarkers, while examining their relevance to Black African adults. The chapter emphasises the intricate nature and variety of African diets, characterised by traditional foods and communal eating practices, and the difficulties in employing these methods to obtain accurate dietary data within this population. The second section outlines the methodology for modifying the EPIC FFQ to reflect the distinct dietary habits and cultural nuances of Black African adults. The modification of the questionnaire is detailed, focussing on how it was modified to accurately represent the common foods and portion sizes relevant to this demographic, while also addressing challenges associated with intricate recipes and communal eating. The concluding section emphasises the validation process, which entailed comparing the modified EPIC FFQ with three multiple-pass 24-hour recalls, a recognised reference method for dietary assessment. This comparison was essential in determining the EPIC FFQ's accuracy in

reflecting habitual dietary intake and confirming its potential as a valid instrument for future studies. This chapter contributes to the development of dietary assessment tools that are culturally sensitive and highlights the importance of validating these tools for specific populations.

4.2 Dietary Assessment Methods and Their Applicability to Black African Adults in the UK

There are several dietary assessment methods that all have strengths and limitations: diet records that ask individuals to report everything they consumed over several days/weeks, 24-hour recalls that involve reporting food consumed in the past 24-hour, FFQs, urinary and plasma biomarkers of intake, for example, urinary Nitrogen or blood–lipid profile that confirm results of food intake (Cade, 2017; Foster et al., 2019; Satija et al., 2015). Recent improvements in digital technologies have brought novel tools for dietary assessment that mitigate certain limitations of traditional methodologies. Mobile applications, wearable devices, and online platforms improve the efficiency and usability of data collecting, facilitating real-time reporting and minimising recall bias (Vijayan et al., 2021). This PhD research focuses on the application of 24-hour dietary recalls and FFQs.

4.2.1 24-Hour Multiple Pass Dietary Recall

The 24-hour recalls method, developed by Thompson and Subar (2008;2017), documents individuals' dietary intake by recording detailed food consumption from the preceding day. This method has been validated across several populations and is extensively employed in national dietary surveys in the UK (Foster et al., 2019) and the US (Moshfegh et al., 2008), demonstrating accuracy in estimating energy and nutrient intakes compared to the FFQ.

To account for daily variability in individual food intake, it is recommended to collect intake data across several days to determine usual food intakes and improve reliability (Thompson & Subar, 2017).

4.2.2 Food Frequency Questionnaires

FFQs have been widely used in large epidemiological studies since the 1990s (Schatzkin et al., 2003). The use of FFQs has numerous advantages compared with other dietary tools as they allow the assessment of food intake over a long-time interval, can estimate the past intake of large populations (Mumu et al., 2020) and has been shown to rank individuals well according to their usual/habitual dietary intake (Molag et al., 2007; Mumu et al., 2020). Furthermore, although FFQs have limitations of recall bias, and are not the easiest dietary assessment tools to use, they are widely regarded as affordable, low-burden for participants, and straightforward to administer (Mumu et al., 2020; Subar, 2004). Self-reported FFQs require individuals to provide data on the frequency of consumption and portion size of several foods. FFQs, unlike other methods, assess the usual habitual intake across a medium or long duration (past 6 months to one year), which can provide valuable insights for understanding and monitoring individuals' dietary behaviours (Subar, 2004).

Despite the strengths of the FFQ, developing one in the context of a more cosmopolitan and globalised world remains a challenge. Variations in food intake within and between persons are increased due to large diversity of food choices. Additionally, frequent out-of-home food consumption limits knowledge of consumed food ingredients, making recall more challenging. A large diversity of food choices can increase within-person and between-person variation in food intake and frequent out-of-home food consumption can limit knowledge of consumed food

ingredients making recall more difficult (Ngo et al., 2009). Evaluating individual diets in Black African groups is challenging because dietary assessment tools need to account for the diversity of the diet, which may include a combination of traditional foods and cuisines from other ethnic populations. An added complexity arises when evaluating cultures where food is eaten with hands and directly from shared dishes (Ngo et al., 2009) (Ngo et al., 2009). Another well-recognised challenge in dietary assessment is the accurate estimation of portion sizes (Blake et al., 1989). Notably, African cuisines are known for their intricate recipes that often use a variety of combined ingredients, including sauces, spices, and vegetables, which can be challenging for people who do not cook the dishes (Mayer-Davis et al., 1999). In light of this, while FFQs are typically considered low-burden compared to other tools due to their straightforward design, further minimising participant burden is still important in order to engage individuals from these specific groups. This can be achieved by limiting the number of food items to those that are familiar to the population, ensuring that participants can respond more easily and accurately (Mumu et al., 2020).

The EPIC FFQ has been widely utilised in various populations including the British adult population (Bingham et al., 1997; Welch et al., 2005), as well as in Spanish (Larroya et al., 2024) and Lebanese adults (Khaled et al., 2021). For use in adults and adolescents in the UK, the EPIC FFQ has been well validated against other dietary assessment methods and urinary and plasma biomarkers of intake, providing a reasonable assessment of habitual diet (Bingham et al., 1997; Lietz et al., 2002; McKeown et al., 2001). However, no validation study of the EPIC FFQ has been conducted among the African population, and its lack of inclusion of traditional African cuisines limits its cross-cultural applicability. To make it suitable for use in Black African populations, it would need to be validated (Mumu et al., 2020). Since all dietary assessment

techniques rely on self-reported consumption; subject to some degree of measurement error, it is necessary to determine the amount of this error before use (Willett et al., 1985). Despite the lack of a universally accepted "gold standard" for food intake measurement, research on the validity of various dietary assessment techniques might provide important insights (Willett, 2012; Willett et al., 1985).

4.3 Aims and Objectives

The aim of this study was to modify and validate the EPIC FFQ for assessing dietary intake among Black African adults living in the UK, ensuring its relevance and accuracy in capturing dietary patterns within this population.

Study Objectives

1. To modify the EPIC FFQ to better reflect the dietary habits, cultural food practices, and food preferences of Black African adults living in the UK, ensuring the inclusion of traditional African dishes.
2. To validate the modified EPIC FFQ by comparing its results against three multiple-pass 24-hour dietary recalls, assessing its reliability and accuracy in estimating dietary intake.

4.4 Methods

4.4.1 Research Design

This study employed a cross-sectional design to support the modification and validation of the EPIC FFQ for assessing dietary intake in Black African adults. Data were gathered at a single point in time to identify culturally relevant dietary patterns and evaluate the tool's accuracy compared to a reference method (Mumu et al., 2020).

4.4.2 Study Population

The inclusion and exclusion criteria for the study are presented in Table 4.1

Table 4.1 Participants Inclusion/Exclusion Criteria

Sample group	Inclusion	Exclusion
Black Adult women	African immigrant women with BMI>25kg/m ²	African immigrant girls under 18 years old <u>Rationale:</u> Individuals under 18 are considered minors in the UK, and their exclusion aligns with safeguarding guidelines. (https://www.gov.uk/government/publications/working-together-to-safeguard-children--2)
	Self-reported ethnicity	Black African women
	Health Status	Black African women with chronic conditions like Type 2 diabetes, pre-diabetes, hypertension, or coeliac disease, which require dietary management, were also excluded. <u>Rationale:</u> The assumption was that these women would already be receiving dietary guidance, potentially affecting their perception of healthy eating advice.
	First or second generation migrant	Third and later generation were excluded. <u>Rationale:</u> Stronger degree of cultural distancing from traditional practices and high levels of dietary acculturation to norms of host country (Ngongalah et al., 2018).
		Adults who could not communicate in English or pidgin (a creole spoken by sub-Saharan Africans) were excluded from the study. <u>Rationale:</u> This was because the interviews were conducted in English with oral pidgin translations by the researcher. Translation costs for languages other than English and pidgin was considered as a mitigating factor. The cost of translation from any other language apart from English and pidgin.
		Additionally, participants lacking the mental capacity to consent, as outlined in the Mental Health Act 2005, were excluded from the study.

4.4.3 Sampling and Recruitment

The present study used a FFQ (Welch et al., 2005) and 24-hour dietary recalls to assess participants' dietary intake (Bradley et al., 2016). In the recruitment phase which took place from September 2022 to March 2023, a variety of strategies were employed. Initial efforts included the distribution of posters, leaflets and social media. However, the primary recruitment was facilitated through other techniques including word of mouth, peer-to-peer influence, snowball sampling and approaching influential individuals within communities (see figure 4.1 below). Effective sampling strategies necessitate identifying key stakeholders within an organisation who can influence the support base for a study (Agyemang et al., 2016). These stakeholders, often termed gatekeepers, possess the authority to grant or deny access to the research population. The literature predominantly discusses the various ways gatekeepers impact participants' decisions to engage in research and emphasises the importance of fostering relationships with them to streamline the recruitment process. However, identifying gatekeepers within the BAME community presents unique challenges (Ekong et al., 2022). A significant aspect of gatekeeping in social research, particularly with hard-to-reach communities, is the existence of multiple layers of gatekeepers (Gřundělová et al., 2024).

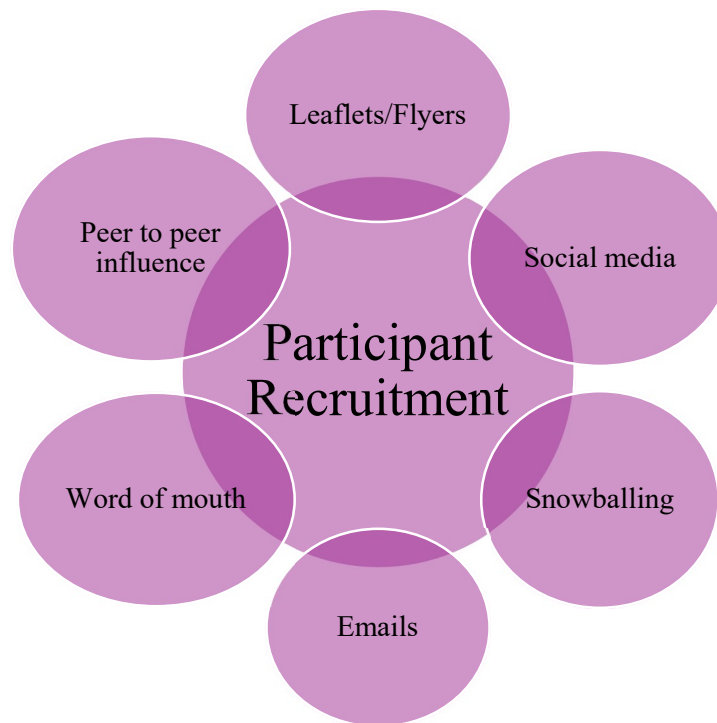
In the present study, appropriate gatekeepers were regarded as heads of churches and mosques, community centres and shopkeepers. However, during data collection, it became evident that other persons also assumed vital gatekeeping roles. These individuals have resided in the community for years and have gained the respect of members of the community. Regarded as reliable by the community, they assumed the role of gatekeepers, determining how the research would be carried out and who would participate in the study. Most of these gatekeepers were specific to the cultural dynamics of the studied demographic. Overall, the process of identifying

gatekeepers was iterative, encompassing initial contact, follow-up, and the definitive identification of significant gatekeepers, who frequently hold informal roles within the community, including respected elders, community organisers, or longstanding neighbourhood residents. The role of community gatekeepers proved vital to the success of the study. It was anticipated that religious leaders and heads of community-based organisations would be the primary gatekeepers. However, it emerged that many Black African women who agreed to participate were connected through respected local women.

While a range of recruitment strategies was employed, it became clear that informal community gatekeepers, particularly respected local women, were the most effective in encouraging participation. These individuals, trusted within their social networks, played a critical role in facilitating access and promoting engagement. In contrast, initial methods such as posters, leaflets, and social media generated limited responses. This highlights the value of culturally embedded, trust-based approaches in effectively reaching Black African women for research participation.

Eleven £20 Amazon gift vouchers were purchased as incentives for the present study. A prize draw for the first six £20 vouchers was held for the initial 142 participants who completed the 24-hour recalls. A second prize draw for the remaining five £20 vouchers was held for 136 participants who completed the FFQ. A random code generator was used to determine the winners who were then contacted to claim their prizes.

Figure 4.1: Recruitment Strategy



4.4.3.1 Study Sample Size

A power calculation estimated the initial sample size for this study (Table 4.2) (Charan & Biswas, 2013). The most recent data from the Office for National Statistics reports an estimated 1,488,380 Black African adults living in the UK, including 779,940 females (ONS, n.d.). In the current study, the sample size was determined using a confidence interval (z)= 1.96, prevalence (p)= 0.10 based on findings from a previous study of obese women with healthier dietary patterns (10%) (Delisle et al., 2009) and precision (d)= 0.05. Therefore, 140 was the sample size needed in order to produce results that reflect the target population. Moreover, this number is recommended by experts in this field who confirm that more than 105 individuals are required to assess the agreement between tools used to evaluate dietary intakes (Mumu et al., 2020; Willett, 2012).

Table 4.2 Power calculation for dietary assessment survey among Black African immigrant women in the UK.

Equation	Calculation
$n = \frac{Z^2 P(1-P)}{d^2}$	$n = \frac{1.96^2 \times 0.10(1-0.10)}{0.05^2}$
Where: n = sample size,	$n = \frac{3.8416 \times 0.09}{0.0025}$
Z = Z statistic for a level of confidence,	n ~ 140
P = expected prevalence or proportion (in proportion of one; if 20%, P = 0.2), and	
d = precision (in proportion of one; if 5%, d = 0.05).	

4.4.4 Collection of Data from FFQ And 3 X 24-Hour Recalls

4.4.4.1 24-Hour Recalls

Participants first completed three 24-hour recalls on separate days; two weekdays and one weekend day, to account for intra-individual variability. The recalls were conducted using Intake24 (<https://intake24.org>, United Kingdom V2_2022, 2022-2023) (Bradley et al., 2016). This method employs a hierarchically organised approach similar to the stages of the UK Low Income and Diet Nutrition Survey.

In the initial step, participants documented the time and provided a quick list of all food and drinks consumed in chronological sequence, without interruption. The second step entailed reviewing the preliminary list to incorporate any forgotten items and clarify ambiguities over the type of food or drink consumed. The third step concentrated on detailed enquiries regarding portion sizes, food types, brands, cooking methods, food combinations (e.g., tea with sugar and milk), and any leftovers. The fourth step required that participants provide details regarding meal occasions, locations, supplement and medication usage, types of vegetables and cooking oils, along with a checklist of any specific diets. Finally, the last step entailed a final probe for any

omitted information, questions regarding takeaway food consumption in the preceding seven days, and any changes in diet since the completion of the recalls.

4.4.4.2 Updating the Intake24 Database: Expanding Coverage for West African Foods

Originally, Intake24, a widely used digital 24-hour recall method, was developed to provide reasonably generalised coverage of foods and is frequently utilised in nutritional epidemiology research. However, while it comprehensively covers many foods available in the UK, it underrepresents those consumed by Black African populations. Between February 2024 and August 2024, a key task was undertaken as part of this PhD programme to update the Intake24 database to better reflect the traditional foods of Black African populations. This work involved extensive collaboration between the PhD research team, Intake24 and nutritionists/dietitians in the UK and Nigeria to collect detailed food data, including recipe instructions, ingredients, and nutrient information, from academic literature (Adepoju & Etukumoh, 2014; Evans & Gajere, 2017; Sanusi & Olurin, 2012), recipe books (Healthier Steps, n.d.; Nigerian Food Recipes, n.d.), and the West African Food Composition Table (Stadlmayr, 2012). This data collection resulted in 47 West African foods and drinks, including Jollof rice, Fufu, Egusi soup, Malt/Malta Guinness, and Goat meat, among others, and included amounts in household measures and grams (both cooked and raw), along with percentage edible portion and percentage weight loss once cooked. Furthermore, culturally relevant photographs of 16 widely consumed foods were provided by the PhD researcher to enhance the intake database update. These photographs were captured using a method that required documenting and photographing gradual increases in portion sizes in grams, beginning with a base serving, ensuring accurate representation for dietary assessments.

The data collected was utilised by Intake24 to assign distinct food codes to these West African foods, which were then incorporated into the Intake24 database. Although the impact of introducing new food codes on enhancing dietary intake analysis in this PhD program cannot be fully quantified, their inclusion enabled more culturally relevant and detailed data capture. This work enhances ethnic food coverage in the Intake24 UK databases, improving utility for diverse sub-populations and contributing to more inclusive dietary research. The continued use of these culturally specific codes offers methodological advantages, laying the groundwork for more robust future evaluations. Figures 4.2- 4.5 below show the photographs, and the weighing process used to objectively estimate portion sizes of foods using Chin Chin, Kuli Kuli and Jollof rice as examples. These images demonstrate the various portion sizes, which were visually captured and weighed to provide accurate portion estimates for each food. This was crucial for the subsequent calculation of daily intake, as accurate portion size estimation is vital in dietary assessments, particularly when assessing foods with varying serving sizes. Furthermore, Figures 4.6 to 4.12 illustrate the photographs of some foods that were weighed and visually recorded, such as vegetable soup. These photographs demonstrate the standardisation of portion sizes for these foods by presenting a sequence of photographs with incrementally larger quantities.

Figure 4.2-4.3: Weighing of portion sizes for missing foods from the Intake24 database (Kuli Kuli)



Figure 4.4: Weighing of portion sizes for missing foods (Jollof rice)



Figure 4.5: Weighing of portion sizes for missing foods (Chin Chin)



Fig 4.6: Photos of vegetable soup showing progressive increase in portion size (38grams)



Fig 4.7: Photos of vegetable soup showing progressive increase in portion size (62grams)



Fig 4.8: Photos of vegetable soup showing progressive increase in portion size (85grams)



Fig 4.9: Photos of vegetable soup showing progressive increase in portion size (117 grams)



Fig 4.10: Photos of vegetable soup showing progressive increase in portion size (147grams)



Fig 4.11: Photos of vegetable soup showing progressive increase in portion size (175 grams)



Fig 4.12: Photos of vegetable soup showing progressive increase in portion size 197grams)



4.4.4.3 Modification of the EPIC FFQ for Black African populations

On completion of the three 24-hour recalls, each participant received an invitation via email or text to participate in the completion of the modified version of the EPIC FFQ. The FFQ was completed using the Jisc online survey software (version 3).

The 131-food item EPIC semi-quantitative FFQ was adapted to more accurately reflect the dietary habits of Black African populations in the UK. Although the structure and frequency categories of the original EPIC FFQ ranging from "never or less than once per month" to "more than six times

per day", were retained for consistency within a UK-based context, the tool was modified through a series of systematic steps aimed at improving cultural relevance while maintaining methodological integrity.

First, a comprehensive review of scientific literature and existing dietary data on Black African populations in the UK was conducted to identify foods and food groups that were missing or underrepresented in the original FFQ (Apekey et al., 2019; Goff et al., 2015; Hill & Madukah, 2021). This process involved evaluating documented nutritional intakes, cultural food preferences, and preparation methods to ensure the inclusion of items that reflected actual consumption patterns within this demographic.

Second, food items were integrated from the collected 24-hour recalls. These recalls yielded a rich dataset of commonly consumed items, which were analysed for their frequency and cultural significance. Drawing from this analysis, additional food items were identified and incorporated into the FFQ. This method mirrors the approach used by Neelakantan and colleagues (2016), who highlighted the value of enhancing FFQ content by leveraging complementary dietary assessment tools to improve both cultural relevance and measurement validity.

Third, while modifications focused on improving cultural relevance, all original food items in the EPIC FFQ were retained. This decision ensured the tool remained broadly applicable and supported cross-study comparisons with other populations. Importantly, preserving the original structure facilitates future validation work by allowing comparisons between the modified and original versions of the FFQ.

Finally, newly added food items were carefully categorised and reorganised within the FFQ to reflect their nutritional content and typical usage in meals. For instance, Egusi soup (a traditional melon seed-based dish often eaten with starchy sides) was categorised under "soups and sauces," while Jollof rice was added as a new food item under the "potatoes, rice and pasta" section. Similarly, other commonly consumed foods such as Fufu were placed in categories that aligned with their culinary roles and nutritional characteristics (Refer to Appendix 2). This stage of categorisation was informed by a detailed review of the composition and cultural significance of each item. Input was also sought from three nutritionists and dietitians familiar with African diets, who provided informal feedback on the appropriateness and usability of the modified FFQ, helping to ensure content validity during its development.

4.4.4.3.1 Covariates

The background information section contained in the EPIC FFQ completed by all participants included self-reported socio-demographic information. Demographics included age (years), ethnicity, country of origin, marital status, migration status, length of residence in the UK (years), employment and household income (pounds). Self-reported anthropometric measures of height (m) and weight (kg)) were included to determine BMI of participants using the formula: $BMI = \text{Weight (kg)} / \text{Height (m}^2\text{)}$. The BMI classification system categorises individuals into underweight, normal/healthy weight, overweight/pre-obesity, and different levels of obesity (obesity 1, obesity 2, obesity 3), as outlined in Table 4.3. These classifications are in accordance with guidelines from the WHO and NICE (NICE, 2014; WHO, 2000), which aim to correlate with the risk of health problems within the population.

Table 4.3 BMI classification (WHO, 2000)

BMI (kg/m ²)	Category
<18.5	Underweight
18.5-24.9	Healthy/Normal weight
25.0-29.9	Overweight/pre-obese
30.0-34.9	Obesity class 1
35.0-39.9	Obesity class 2
≥40.0	Obesity class 3

4.5 Data Analysis

Descriptive results were expressed as means and standard deviations, or medians and IQR.

Estimation of Total Energy Intake (TEI) and nutrient intakes is detailed in Chapter 5, Study 3, Section 5.7.3. The current section explains how the Intake24 tool for 24-hour recalls was applied in this context, specifically differentiating between Intake24 and the manual approach used for traditional African foods.

The FFQ data were analysed through FETA software that is designed to derive food composition (energy, macro- and micronutrients) (Mulligan et al., 2014). For foods already represented in the Intake24 database (Bradley et al., 2016). Total Energy Intake (TEI) and nutrient values were automatically calculated based on the 24-hour recall data. However, traditional African foods that were not initially represented in the database required a different approach. These foods were identified as "missing" due to Intake24's underrepresentation of foods common in Black African populations.

To address this, portion sizes for the missing traditional foods were estimated using a combination of standardised methods for household measures based on published data on cultural serving sizes (Sanusi & Olurin et al 2012) and direct weighing for non-household measures.

Once portion sizes were established, nutrient intakes were manually calculated by multiplying the frequency of consumption by the nutrient composition per 100 grams/day and the estimated portion size in grams. These values were then summed to determine the total daily contribution of traditional foods to each participant's intake (Sharma et al., 1999). Mean daily intake was derived from the average across three self-reported 24-hour recalls.

Descriptive results were expressed as means and standard deviations, or medians and IQR. Nutrient variables were not normally distributed, these were log-transformed (log10) to reduce skewness and optimise the normality of the distribution. Despite this transformation, which is commonly used to stabilise variance and make data more suitable for statistical analysis (Osborne, 2002) the data remained non-normally distributed. Further assessment confirmed that alternative transformations, such as square root or inverse, did not substantially improve normality. As a result, non-parametric methods were employed for subsequent analyses.

TEI and nutrient intakes from the FFQ were compared with the average of three 24-hour recalls questionnaires using Spearman's rho correlation coefficients. In general, correlation coefficients ranging from 0.4 to 0.6 are often presented as evidence of moderate validity for an instrument (Thompson & Subar, 2017). Therefore, Spearman's rho coefficient within this range suggests that the FFQ exhibits a moderate correlation with the 24-hour recall method, indicating a reasonable level of agreement between the two instruments. Adjusted correlation coefficients for TEI were calculated using the residual method (Willet et al., 1997) (with TEI as the independent variable and the nutrient as the dependent variable). Energy adjustment was conducted using the residual method (Willet et al., 1997). The de-attenuated correlations (Rosner & Willet, 1988) were calculated to remove the within-person variability found in the 24-hour recall questionnaires using the following formula:

$$r_t = r_0 \sqrt{1 + r/n}$$

r_t is the corrected correlation between the energy adjusted nutrient derived from the FFQ and 24-hour recalls questionnaires, r_0 is the observed correlation, r is the ratio of estimated within-person and between-person variation in nutrient intake derived from the three 24-hour recalls questionnaires, and n is the number of replicated recalls ($n = 3$). Bland–Altman plots were used to assess agreement between the two methods (Bartlett & Frost, 2008; Bland & Altman, 1999). For this analysis, the average values of the FFQ and three 24-hour recalls $((\text{FFQ} + \text{Mean 24-hour recalls})/2)$ were plotted against the difference in intake between the two methods, and the limits of agreements (mean difference ± 1.96 SD (differences)) were used to show the degree of concordance between the two methods. In addition to this, linear regression (24-hour recall as dependent and FFQ as independent variables) was conducted for each nutrient to derive the slope coefficient to determine the degree of overestimation or underestimation of nutrient intakes from the FFQ compared with the average of the three 24-hour recalls. All analyses were conducted using SPSS version 29. A $p < 0.05$ was considered statistically significant for all analyses.

4.6 Results

The final version of the adapted FFQ contained 141 food items, which were classified into 10 groups as follows: 1) Meat and Fish 2) Bread and savoury biscuits 3) Cereals 4) Potatoes, rice and pasta 5) Dairy products and fats 6) Sweets and snacks 7) Soups, Sauces and spreads 8) Drinks 9) Fruit 10) Vegetables (Appendix 2). This represents an increase of 10 items compared to the original EPIC FFQ which contained 131 items. Before final use, the adapted FFQ was piloted among 10 Black African women to ensure clarity, cultural appropriateness, and comprehension. Minor adjustments were made based on participants' feedback, such as rewording some items. The pilot data were used solely for refining the tool and were not included in the main analysis. A total of

112 participants completed both the FFQ and three 24-hour recall dietary assessments. Participant characteristics are described in Chapter 5, study 3 presented in Table 5.2. The median intake of TEI, macro-nutrients and micro-nutrients measured by the FFQ and the 24-hour recalls questionnaires are presented in Table 4.4. Overall, median (IQR) daily nutrient intakes reported via the FFQ were higher than those estimated from the 24-hour recalls. For example, protein intake was notably higher when measured by the FFQ, with a median of 245 g/day (IQR: 224–255), compared to 167 g/day (IQR: 151–181) from the 24-hour recalls. A similar trend was observed for fibre, where the FFQ yielded a median intake of 59 g/day (IQR: 51–64) versus 31 g/day (IQR: 26–35) from the 24-hour recalls, a difference that was statistically significant ($p < 0.001$). Other nutrients such as total saturated fat, calcium, magnesium, vitamin C, and selenium also showed significantly higher median values when assessed using the FFQ (Table 4.4). Correlation coefficients between nutrient intakes estimated by the FFQ and the mean of the 24-hour recalls varied by nutrient, with all values being statistically significant. Crude (unadjusted) Spearman rank correlations ranged from 0.21 for fibre to 0.87 for protein. After adjusting for total energy intake, correlations slightly decreased but remained statistically significant, ranging from 0.19 for fibre to 0.86 for protein. De-attenuation of these correlations to account for within-person variability in the 24-hour recalls led to an increase in all coefficients, ranging from 0.22 for fibre to 0.88 for protein. These findings suggest that the FFQ performs well in estimating some nutrients, particularly protein and sugar, while demonstrating lower validity for others such as fibre and polyunsaturated fats. (Table 4.4). Bland-Altman plots were used to assess the agreement between the FFQ and 24-hour recalls methods for energy, key macronutrients (protein, carbohydrate, fat) and sugar (Figures 4.13 to 4.17). The plots revealed that, on average, the FFQ overestimated nutrient intakes compared to the 24-hour recalls, with varying levels of agreement (Table 4.5). For energy, the

mean difference was +62 kcal/day, but the limits of agreement were wide (from -620 to +744 kcal/day), indicating considerable variability at the individual level. Protein showed a mean difference of +76 g/day with relatively narrow limits of agreement (58 to 94 g/day), and a high β -coefficient of 0.89 ($p < 0.001$), suggesting strong agreement. Carbohydrate intake was overestimated by 17 g/day on average, with limits of agreement from -36 to +70 g/day and a β -coefficient of 0.70. Total sugar intake was overestimated by 29 g/day with limits of agreement between 19 to 39, while total fat showed a mean difference of +17 g/day with broader agreement limits (from -50 to +84g/day), but both nutrients demonstrated high agreement as indicated by β -coefficients of 0.81 and 0.84 respectively. Fiber had a poorer agreement, with a mean difference of +27 g/day and limits ranging from -12 to +66 g/day, reflecting both the FFQ's consistent overestimation and the variability in its estimates compared to the 24-hour recalls method (Table 4.5). These results, presented in Table 4.5 and Figures 4.13 through 4.17, indicate that while the FFQ generally overestimates intake levels relative to 24-hour recalls, it demonstrates acceptable validity and agreement.

Table 4.4 Median, 25th and 75th percentile for daily nutrient intakes from the FFQ and 24-hour recalls, correlation coefficients and Wilcoxon signed rank test (n = 112)

Nutrients	FFQ median (IQR)	24-hours Recalls median (IQR)	Wilcoxon signed rank test <i>P</i>	24-hour Recalls Vs Food Frequency Questionnaire		
				Spearman's coefficient of rank correlation (p)		
				Unadjusted	Energy adjusted	De-attenuated
Energy (kcal/d)	3129 (2904–3347)	3055 (2796–3291)	0.327	0.54*	-	0.56*
Protein (g/d)	245 (224–255)	167 (151–181)	0.003	0.87*	0.86*	0.88*
Carbohydrate (g/d)	739 (689–759)	712 (683–738)	0.752	0.66*	0.59*	0.69*
Total Sugars (g/d)	227 (220–233)	197 (172–223)	0.312	0.80*	0.78*	0.82*
Fiber (g/d)	59 (51–64)	31 (26–35)	<0.001	0.21*	0.19*	0.22*
Total Fat (g/d)	178 (145–245)	172 (141–199)	0.501	0.82*	0.82*	0.83*
Total MUFA (g/d)	99 (89–111)	81 (74–92)	<0.001	0.25*	0.25*	0.29*
Total PUFA (g/d)	66 (55–74)	56 (48–62)	<0.001	0.30*	0.33*	0.34*
Total SFA (g/d)	64 (54–71)	32 (28–37)	<0.001	0.77*	0.80*	0.95*
Vitamin A (mcg/d)	1279 (1178–1391)	1583 (1303–1845)	0.005	0.53*	0.50*	0.70*
Vitamin C (mg/d)	86 (69–101)	50 (41–67)	<0.001	0.60*	0.38*	0.61*
Vitamin E (mg/d)	38 (32–40)	29 (25–33)	0.116	0.68*	0.67*	0.71*
Selenium (mcg/d)	311 (285–350)	205 (189–221)	0.115	0.34*	0.31*	0.36*
Magnesium (mg/d)	779 (740–849)	446 (420–474)	0.001	0.53*	0.40*	0.63*
Calcium (mg/d)	1334 (1202–1455)	813 (751–883)	<0.001	0.43*	0.39*	0.52*
Iron (mg/d)	21 (18–22)	12 (10–14)	0.091	0.66*	0.51*	0.71*

MUFA monounsaturated fatty acid, PUFA polyunsaturated fatty acid, SFA saturated fatty acid Correlation is significant at *P<0.05

Table 4.5 Limits of agreement (LOA) and β - coefficients between FFQ and average of three 24-hour recalls*

Energy and nutrients	Mean difference (FFQ and average 24-hour recalls)	SD	95% LOA lower, upper	β	<i>P</i>
Energy (kcal/d)	62	348	-620, 744	0.57	<0.001
Protein (g/d)	76	9	58, 94	0.89	<0.001
Carbohydrate (g/d)	17	27	-36, 70	0.70	<0.001
Total Sugars (g/d)	29	5	19, 39	0.81	<0.001
Fiber (g/d)	27	20	-12, 66	0.29	0.043
Total Fat (g/d)	17	34	-50, 84	0.84	<0.001
Total MUFA (g/d)	17	5	7, 27	0.28	0.052
Total PUFA (g/d)	8	7	-6, 22	0.33	0.007
Total SFA (g/d)	31	1	29, 33	0.84	<0.001
Vitamin A (mcg/d)	-299	193	-677, 79	0.58	<0.001
Vitamin C (mg/d)	37	19	0, 74	0.62	0.001
Vitamin E (mg/d)	7	1	5, 9	0.70	<0.001
Selenium (mcg/d)	106	8	91, 121	0.38	0.014
Magnesium (mg/d)	334	15	304, 364	0.47	0.007
Calcium (mg/d)	524	19	487, 561	0.47	0.003
Iron (mcg/d)	8	1	6, 10	0.68	<0.001

*Mean difference and LOA were derived through a one-sample t test. β -coefficients and P-values were derived through a linear regression

Fig 4.13: Bland-Altman plot of difference between energy as predicted by the FFQ and mean of three 24-hour recalls

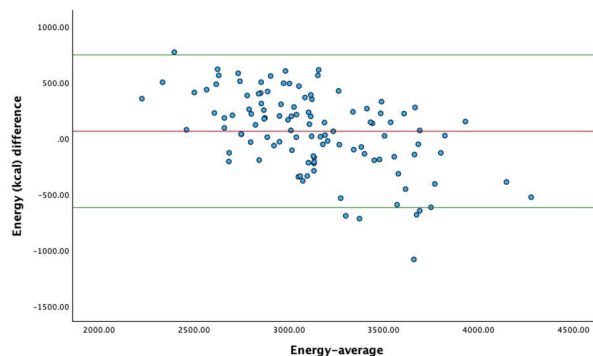


Fig 4.14: Bland-Altman plot of difference between protein as predicted by the FFQ and mean of three 24-hour recalls

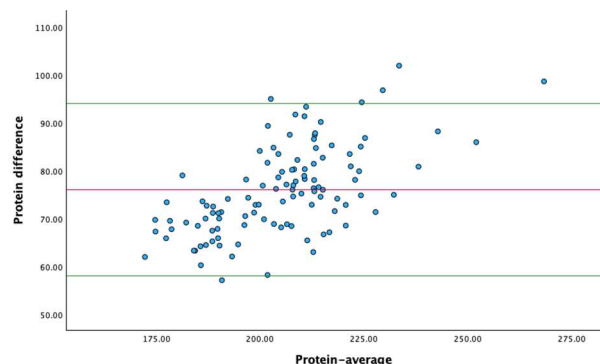


Fig 4.15 Bland-Altman plot of difference between carbohydrate as predicted by the FFQ and mean of three 24-hour recalls

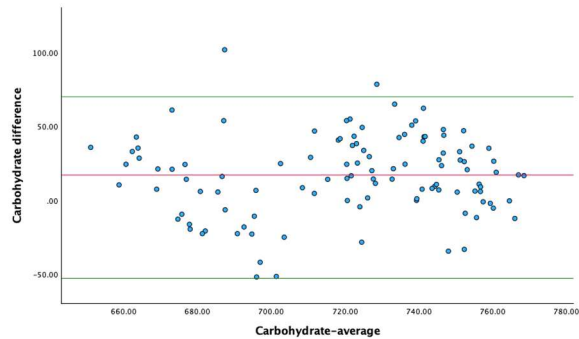


Fig 4.16 Bland-Altman plot of difference between sugar as predicted by the FFQ and mean of three 24-hour recalls

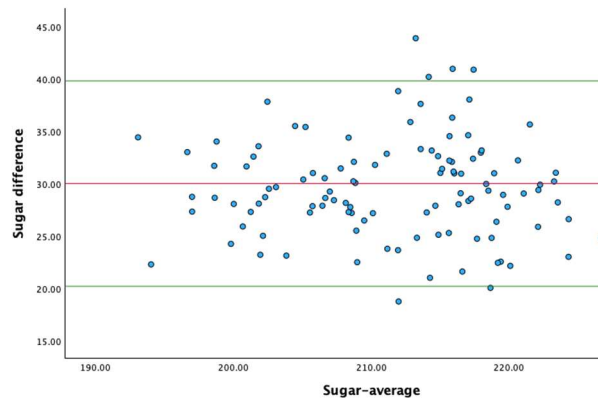
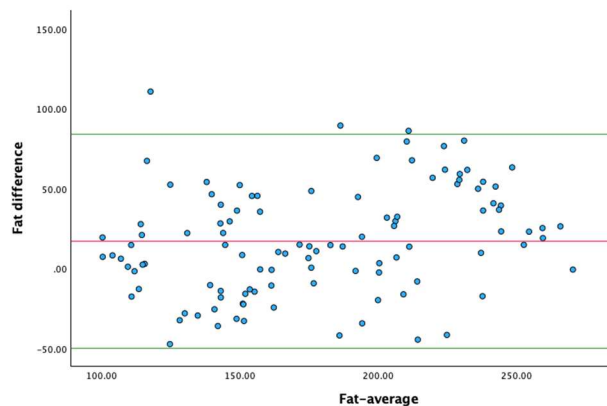


Fig 4.17 Bland-Altman plot of difference between fat as predicted by the FFQ and mean of three 24-hour recalls



4.7 Discussion

The modification and validation of the EPIC FFQ for Black African adults in the UK represents an important step towards improving dietary assessment tools that are tailored to culturally diverse populations. This study is, to the researcher's knowledge, the first to attempt such a modification and validation in a Black African women population, which is one the novel aspects of this PhD research. This study reflects the dietary habits specific to Black communities in the UK, including traditional African foods, although may not be fully generalisable to all black African populations, particularly those with different cultural backgrounds. Nonetheless, this also addresses a notable gap in the literature concerning dietary intake assessment among this demographic.

This study demonstrates that the culturally adapted version of the EPIC FFQ is a valid tool for assessing habitual dietary intake among Black African women residing in the UK. The FFQ, modified to reflect culturally specific foods and eating patterns, showed moderate to strong validity for a range of nutrients when compared with three non-consecutive 24-hour recalls, with all correlation coefficients reaching statistical significance. Notably, de-attenuated Spearman coefficients ranged from 0.22 for fibre to 0.88 for protein, indicating good performance for key macronutrients, particularly protein and fat. Bland-Altman analyses supported these findings, with relatively small mean differences and acceptable limits of agreement for most nutrients, especially protein and sugar, further reinforcing the FFQ's capacity to provide reasonable group-level estimates of dietary intake in this population.

A consistent trend observed across nutrients was the overestimation of intakes by the FFQ relative to the 24-hour recalls, a well-documented phenomenon in validation research (Saravia et al., 2022).

This may be attributed to the nature of FFQs, which prompt respondents to recall typical intake over extended periods and may encourage over-reporting, especially for frequently consumed or culturally salient foods. The inclusion of a broader, culturally relevant food list may have amplified this tendency by increasing respondents' likelihood of recognising and affirming intake of familiar items. For example, the FFQ overestimated protein intake by 76 g/day on average and fibre by 27 g/day, reflecting not only methodological biases but potentially also a more comprehensive capture of habitual consumption patterns, especially of traditional foods.

These findings align with those of El Kinany et al. (2018), who validated a culturally adapted FFQ among Moroccan adults. Their tool, which incorporated 255 culturally specific items, yielded de-attenuated correlation coefficients ranging from 0.24 (fibre) to 0.93 (total MUFA). The strong correlations reported in their study mirror those in the current analysis and further support the notion that cultural adaptation enhances the accuracy of dietary tools. Similar validation efforts in other populations such as those by Shatylo and Solovyova (2024) in Ukraine and Khaled et al. (2020) in Lebanon, who reported more weak correlations with coefficients in the range of 0.07 to 0.46 and -0.002 to 0.34, respectively. Despite differences in methodology, food environments, and population characteristics, a common pattern across all studies, including ours, was the FFQ's tendency to overestimate intake compared to reference methods. These consistent trends underscore the reliability of culturally adapted FFQs in capturing habitual dietary patterns, particularly when used at the population level.

The present study contributes significantly to an under-researched area of nutritional epidemiology by focusing on a demographically distinct and culturally rich population often overlooked in dietary research. The inclusion of both traditionally African and Westernised food

items ensures that the adapted FFQ reflects dietary transitions occurring within Black African communities in the diaspora. This is particularly important given the increasing interest in understanding the nutrition-related health risks among migrant and ethnic minority populations (Leung & Stanner, 2011). By demonstrating Spearman's rho correlation coefficients ranging from 0.21 for fiber to 0.84 for total protein, the modified FFQ shows a range of low to strong validity across various nutrients. These findings indicate that the modified tool effectively captures key aspects of dietary intake within this population, with stronger correlations observed for macronutrients such as protein and fat. The findings highlight the robustness of the modification process. These results are consistent with validation outcomes from similar research, including those by El Kinany et al. (2018) and Khaled et al. (2021), which suggest that cultural relevance may improve the accuracy of dietary assessments. While the present study did not include a direct comparison with a White or other ethnic population, due to its specific focus on Black African women in the UK, it nonetheless contributes practical insights into the value of culturally tailored dietary assessment tools. This targeted approach addresses a significant gap in the literature, as Black African populations remain underrepresented in dietary validation studies. Future research could build on this work by incorporating comparative analyses to explore how culturally adapted tools perform across different population groups.

Beyond its cultural relevance, the study is methodologically rigorous. The use of three non-consecutive 24-hour recalls as a reference method is in line with best practices in dietary validation studies and helps mitigate day-to-day variation in dietary intake. The decision to apply de-attenuation procedures further strengthens the analysis by correcting for within-person variation inherent in the 24-hour recalls method. Nevertheless, energy adjustment led to slightly weaker

correlations, a trend observed in previous studies and likely due to the reduction of inter-individual variability following standardisation for energy intake (El Kinany et al., 2018).

However, some limitations must be acknowledged. First, the relatively short data collection period may not have captured seasonal dietary variations. This is particularly relevant for populations with food traditions tied to religious or cultural calendars. Second, the FFQ's length of 141 items, though justified by the need for cultural specificity, may have introduced respondent fatigue or reduced accuracy among individuals with lower literacy levels. Third, the study sample was skewed toward women with higher educational attainment, potentially limiting generalisability to the broader Black African population in the UK, which spans diverse socioeconomic and educational backgrounds. Expanding recruitment to include individuals with lower literacy levels and those from a broader range of African subgroups would enhance representativeness.

A further methodological limitation arises from the inherent differences between FFQs and 24-hour recalls (Moshfegh et al., 2008; Thompson & Subar, 2017). While the former assesses long-term intake and is susceptible to recall and social desirability bias, the latter reflects short-term intake and may underrepresent episodically consumed foods. Thus, while the use of both tools is complementary, correlations between them must be interpreted with caution, as they may reflect the unique biases inherent in each dietary assessment method. The application of statistical corrections such as de-attenuation helps address this issue but does not eliminate the underlying methodological discordance between tools.

Despite these limitations, the adapted EPIC FFQ has significant potential for use in epidemiological research, dietary surveillance, and public health nutrition targeting Black African women in the UK. Its modification and validation represent a critical advancement in the pursuit

of equitable, inclusive, and accurate dietary assessment tools. As the UK population continues to diversify, the need for culturally sensitive methodologies becomes increasingly urgent; not only to improve dietary measurement but also to inform effective, targeted health interventions.

4.8 Conclusion

To the best of the researchers' knowledge, the present study provides the first validation of a culturally adapted EPIC FFQ for use among Black African women living in the UK and demonstrates that the tool has acceptable validity in assessing habitual intake, particularly of macronutrients. The inclusion of traditional and Westernised foods enhanced the FFQ's relevance and applicability to this population, and its performance compares favourably with similar validation efforts globally. While further refinement, longer-term testing, and broader population inclusion are recommended, the tool represents a meaningful step toward addressing the lack of culturally appropriate dietary assessment methods in nutritional epidemiology. Future research should continue to explore ways to adapt and validate the instrument for diverse populations to ensure more equitable and accurate dietary data collection. Additionally, future research investigating the validity of the modified EPIC FFQ further, incorporating nutritional biomarkers for a more rigorous evaluation is warranted.

Chapter 5

Thesis study map: Study 3

Study	Objectives
Study 1: Effectiveness of Client-Centred Counselling on Weight Management among Black African Women with Overweight and Obesity in High-Income Countries: A Systematic Review	Objectives: to evaluate the effectiveness of client-centred counselling on weight management in Black African women with overweight and obesity and provide information about: • specific intervention component and skills used • culturally tailored strategies, and theoretical underpinnings
Study 2: Modification and validation of the EPIC FFQ to assess dietary intake in Black African adults	Objectives: • To modify the EPIC FFQ to better reflect the dietary habits, cultural food practices, and food preferences of Black African adults • To validate the modified EPIC FFQ
Study 3: Assessment of Dietary Patterns among Black African Women from sub-Saharan Africa living in the UK	Objectives: • To determine the dietary intake and associated demographic factors • To classify dietary patterns and any associated determinants.
Study 4: A qualitative study exploring factors influencing dietary choices of Black African women with overweight and obesity from Sub-Saharan African living in the UK	Objectives: • With dietary patterns identified from study 3, investigate the factors that influence Black African immigrant women's dietary choices and eating habits.
Study 5: A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women (The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change Wheel	Objectives: • With findings from study 1, 2, 3 and 4, design a nutritional and lifestyle program targeting overweight and obesity among Black African women in the UK

Chapter 5

Study 3: Assessment of Dietary Patterns among Black African Women from Sub-Saharan Africa living in the UK

5.1 Introduction

Building upon the insights from the preceding chapter, which outlined the modification and validation of the EPIC FFQ for assessing dietary intake among Black African adults, this chapter, Study 3, focusses on the utilisation of this validated tool in understanding dietary patterns within this specific demographic. The modified EPIC FFQ, designed to reflect the distinct dietary habits of Black African populations, underpins the examination of dietary behaviours among Black African women from sub-Saharan Africa residing in the UK.

This chapter elucidates the findings derived from a cross-sectional study that examines the dietary patterns of Black African women from sub-Saharan Africa residing in the UK. Dietary patterns were developed through Principal Component Analysis (PCA), utilising dietary intake data collected through the modified EPIC FFQ, thereby facilitating the exploration of typical foods and meal consumption within this demographic. The chapter is divided into two sections. The first section presents an overview of dietary assessments within this particular demographic, detailing the methodologies employed to assess dietary intake. The second section presents the findings of the study, describing the typical foods and meals consumed, with a focus on both traditional African dishes and the adaptations made within the UK context. Furthermore, it assesses the nutritional quality of the diet, identifying possible nutrient deficiencies or excesses, and examines the impact of sociodemographic factors—such as age, income, education, and duration of residence in the UK—on dietary choices.

5.2 An Overview of Dietary Intake and Patterns in Black and Minority Groups

The assessment of dietary habits among Black and minority ethnic groups is critical for surveillance programs in countries characterised by diverse settled and transitional populations, such as the UK, to facilitate the implementation of effective interventions within these populations (Leung & Stanner, 2011). As highlighted in Chapter 1, section 1.4, the UK remains multi-ethnically diverse and has experienced a considerable demographic transformation in recent decades, marked by a significant increase in its Black African population; increasing from 0.9% in 2001 to 2.5% in 2021 of the overall population (ONS, n.d.). Chapter 2, Sections 2.1 and 2.2 highlighted the wide variation in the prevalence of non-communicable diseases like obesity between different ethnic groups, which is thought to be associated with dietary practices more so than with genetic background (Leung & Stanner, 2011). Likewise, Chapter 2, section 2.5 showed ethnic differences in dietary habits among adults in the UK. However, very little is known about the food consumption and nutritional composition of Black African adults in the UK. As discussed in section 2.6, there is an association between long residence and increased dietary acculturation among Black African immigrants (Apekey et al., 2019; Goff et al., 2015). So too, is the adoption of bicultural dietary patterns post-migration of Westernised and African dietary practices, with carbohydrates and fats being the main sources of energy (Asante et al., 2015; Gibson et al., 2015; Goff et al., 2015). Nonetheless, the reported average nutrient composition of the diets of participants in these studies provide limited information on micronutrients, with a predominant focus on energy and macronutrients. Moreover, it is not clear whether these dietary patterns have changed in more recent years.

Dietary intake is a pivotal and modifiable risk factor for cardiovascular and metabolic diseases, with higher susceptibility observed within minority ethnic groups and other vulnerable

populations (Yang et al., 2014). Examining specific dietary elements, high added sugar intake is positively linked to dyslipidemia (Welsh et al., 2010, 2011), cardiovascular disease mortality (Yang et al., 2014), and obesity (Te Morenga et al., 2013). Conversely, increased dietary fibre intake is associated with improved satiety control (Kaczmarczyk et al., 2012) and potentially with decreased risk of obesity, coronary heart disease (CHD) (Threapleton et al., 2013; Wu et al., 2015), Type 2 diabetes mellitus (T2DM) (Sluijs et al., 2010), and cardiovascular- and all-cause mortality (Schoenaker et al., 2012).

Moreover, excessive energy intake and consumption of energy-dense foods are associated with an increased risk of obesity (Puska et al., 2003) and higher fasting plasma glucose levels and insulin resistance (Mozaffarian et al., 2009). Trans fats are linked to increased risk of CHD (Chowdhury et al., 2014), whereas diets rich in polyunsaturated and monounsaturated fatty acids (PUFA and MUFA) are regarded as potentially cardioprotective and may have an inverse relationship with blood pressure, although this remains a topic of debate (Miura et al., 2013; Schwab et al., 2014). The role of saturated fatty acids (SFAs) also remains debated, with new findings indicating both potential detriments and benefits (Astrup et al., 2020). Conversely, increased salt intake is positively correlated with increased blood pressure (He et al., 2013). A comprehensive understanding of the complex interplay between dietary patterns and health outcomes necessitates a broad perspective that includes diverse groups (Leung & Stanner, 2011).

5.3 Aims and Objectives

This study aimed to explore the dietary patterns of overweight and obese Black African women from sub-Saharan Africa living in the UK. Ultimately, this provides insights into the nutritional status within this group burdened with diet-related health issues. Moreover, it will inform the

development of culturally sensitive nutrition and healthy lifestyle interventions, and nutrition policies aimed at improving health outcomes in this demography.

Study Objectives

1. To identify the socio-demographic characteristics of the Black African immigrant sample
2. To determine the dietary intake among Black African women in the UK and associated demographic factors
3. To classify dietary patterns of Black African women in the UK and any associated determinants.

5.4 Methodology

5.4.1 Research design

With a cross-sectional design, this study collected data from participants at a specific moment in time to provide a body of quantitative information related to multiple variables (Bryman, 2008).

This design made it possible to examine the associations between variables and explain the incidence and characteristics of the concepts measured. While causality cannot be directly inferred, these associations can still contribute valuable insights into potential relationships between variables (Maier et al., 2023).

5.4.2 Study Population and Sampling

Eligibility criteria and sampling techniques for the study are presented in Chapter 4, Study 2, Table 4.1.

5.4.3 Data Collection Tool

The process of modifying and validating the EPIC FFQ has been outlined in detail in Chapter 4.

5.4.4 Estimating the Extent of Misreporting of Energy Intake in the Final Sample

Misreporting, particularly underreporting, is a well-documented limitation of dietary assessment methods, influenced by variables such as age, sex, and BMI (Livingstone & Black, 2003; Mendez et al., 2011; Schatzkin et al., 2003; Subar et al., 2003; Trumbo et al., 2002). Individuals with obesity often underestimate their energy intake, particularly from foods perceived as unhealthy, such as those high in fats or refined carbohydrates (Mendez et al., 2011; Willett, 2012). Misreporting can significantly affect research on diet, obesity, and disease outcomes. Implausible energy intakes, known as "implausible reporters," are generally identified by comparing reported energy intakes (REIs) with estimations obtained from objective methods such as doubly labelled water (Samuel-Hodge et al., 2004). Nonetheless, these methods are impractical for large population-based studies, resulting in the development of indirect methods to identify under-reporters and over-reporters (Livingstone & Black, 2003; Mendez et al., 2011). One such indirect method is the Goldberg method that compares the ratio of REI to basal metabolic rate (BMR) in relation to physical activity level (PAL). If the ratio deviates beyond set cutoffs, the REI is considered implausible (Goldberg et al., 1991). An alternative method is the predicted total energy expenditure (pTEE) approach, which employs prediction equations derived from doubly labelled water data (Tooze et al., 2007). Both methods rely on similar REI ratios and cutoffs to identify implausible reporting. However, the simpler, recommended method employs preset cutoffs for plausible energy intake, generally ranging from 500 to 3,500 kcal/day, to exclude extreme results without requiring complex calculations.

In this study, the Nurses' Health Study cutoffs (<500 kcal/day and >3,500 kcal/day) were used to identify implausible reporters. While these cutoffs are straightforward and commonly used in large epidemiological studies, their simplicity raises questions about their sensitivity and

specificity compared to more nuanced methods like the Goldberg or pTEE approaches. Mendez et al. (2011) observed that applying these NHS thresholds yielded regression coefficients similar to models including all participants, suggesting that this approach may retain statistical power and external validity. However, this finding does not necessarily imply that the method is superior; rather, it may reflect the robustness of the models used or the homogeneity of the population studied. In contrast, the Goldberg and pTEE methods incorporate individual variability in metabolic rates and activity levels, potentially allowing for more tailored and accurate identification of mis-reporters.

Yet, these methods are more resource-intensive and rely on assumptions (e.g., PAL estimates) that may introduce their own biases. The choice of method, therefore, reflects a trade-off between pragmatism and precision. In the context of this study—focused on a general population sample with limited metabolic data, the NHS cutoffs offer a transparent and replicable strategy for identifying extreme misreporting, though at the expense of individual-level accuracy. Importantly, this method aligns with previous large-scale studies, supporting comparability across research (Livingstone & Black, 2003; Mendez et al., 2011). Nonetheless, future work should consider validating these cutoffs against biomarker-based methods (e.g., doubly labelled water) within the study population to determine whether more complex methods would yield significantly different or more valid associations between dietary intake and health outcomes. The present study identified 24 people as over-reporters, who were excluded from the final analysis.

5.4.5 Methodological Approaches for Dietary Pattern Analysis

PCA is the most commonly employed multivariate statistical technique to summarise diet (Newby and Tucker, 2004), aiming to reveal the underlying patterns within a dietary dataset. Inter-correlations between intakes of foods/food groups are exploited to generate a number of dietary components that explain the maximal possible variation in food intake (Moeller et al., 2007). Each food item/group entered into the PCA is correlated with each component via a factor loading, thereby indicating the relative importance of each food group to a particular pattern. The patterns generated are neither discrete nor mutually exclusive in nature, and each individual receives a score for each dietary pattern. Subjectivity inherent in labelling the dietary components extracted from the analysis limits between-study comparison, although further examination of the food groups comprising the dietary components can improve comparability (Northstone & Emmett, 2010). The use of further statistical analyses then allows overall scores on dietary patterns to be correlated with a range of socio-demographic and behavioural variables to enable meaningful interpretations (Northstone et al., 2014; Northstone & Emmett, 2010). This process facilitates identification of groups of individuals who possess similar socio-demographic or behavioural characteristics - most in need of nutritional intervention. By highlighting significant variations, PCA facilitates the interpretation of dietary data and helps identify strong patterns. Numerous studies have utilised PCA to examine dietary patterns in relation to health risks, socio-demographic factors, cognitive status, and lifestyle variables (Northstone et al., 2014).

Cluster analysis (CA) on the other hand, usually takes a more subject-focused approach to analysis with the aim of detecting interrelationships among subjects, rather than variables (Thorpe et al., 2016). This technique can therefore be used to separate individuals into discrete –

and relatively homogenous – groups based on their dietary intake (Hoffmann et al., 2002; Hu, 2002) therefore easing interpretation for the researcher. CA has been employed to a somewhat lesser extent throughout the dietary literature, but a body of research that has utilised this method exists (Greenwood et al., 2000; Newby & Tucker, 2004). Following cluster generation, further statistical analyses can again be employed to define clusters by a range of socio-demographic and other variables (Smith et al., 2011). Notably, researchers who have applied both PCA and CA to the same dataset report high compatibility in patterns extracted (Crozier et al., 2006; Hearty & Gibney, 2008; Smith et al., 2011). The continuous nature of food pattern scores extracted from PCA may make this method a more pragmatic approach to dietary analysis. Although the combined use of PCA and CA techniques may enable a greater understanding of a population's diet (Crozier et al., 2006; Smith et al., 2011), only PCA was employed in this study to identify dietary patterns.

5.4.5.1 Application of PCA to Dietary Patterns in Black African Populations in the UK

There has been a lack of research applying PCA to investigate dietary patterns among Black African populations in the UK. This gap presents an opportunity to use PCA to uncover potential correlations between various foods and food groups within this demographic, providing deeper insights into habitual dietary patterns (Mullie et al., 2010). Conducting PCA requires several methodological decisions, including the quantification of food groups (input variables). These input variables can differ between studies and might include metrics such as frequency of consumption, gram weights, energy-adjusted weights and daily percentage energy contribution (Newby & Tucker, 2004; Smith et al., 2013).

5.5 Data Analysis

Statistical analyses were conducted using IBM SPSS v.29.02 (SPSS Inc., Chicago, Illinois, USA) and Microsoft Excel 2024. The data were screened and cleaned to identify outliers and errors, utilising boxplots for categorical variables (e.g., age groups, gender, education and marital status) and continuous variables (BMI). Normality was assessed through graphical inspections of histograms and the Shapiro-Wilk test. A significance level of $p > 0.05$ indicated that the assumption of normality was not violated. Descriptive statistics were used to describe sociodemographic factors and the frequency of food intake. Descriptive data are presented as mean values with standard deviations for normally distributed continuous data, and as median with interquartile range (IQR) for non-normally distributed data. For example, the majority of non-African foods were not evenly distributed as most participants consumed never or less than once per month. Some extreme outliers were retained within the data because they were considered within an acceptable range of consumption (e.g. food consumption of mixed dishes of 5-6 times per week). These high scores skewed the data and affected the mean, meaning that the data were best represented by the median. For categorical data, frequencies and percentages are reported.

The FFQ data were analysed through FETA software that is designed to derive dietary data (energy, macro- and micronutrients). The selected frequency of consumption for each food item in the FFQ was converted to portions in grams per week using specific frequency factors: Never or less than once a month = 0, 1-3 times per month = 0.07, once a week = 0.14, 2-4 times per week = 0.43, 5-6 times per week = 0.79, once a day = 1, 2-3 times per day = 2.5, and 4-5 times per day = 6 (Mulligan et al., 2014).

PCA was performed using the dimension reduction and FACTOR procedures in SPSS to identify key components that account for variations in dietary intake. The 141 food items from the modified EPIC FFQ were grouped into 19 distinct food categories (Table 5.1), each with its own nutrient profile. This classification adhered to the groupings used in both the UK National Diet and Nutrition Survey (NDNS, n.d.) and previous research on West African migrants (Delisle et al., 2009).

The categorisation of foods into separate groups—specifically cereals, whole grains, and starchy items such as potatoes and pasta—was guided by the aim to capture nuanced and culturally specific dietary patterns among Black African populations in the UK. Traditional foods like fufu, Garri/Eba, Jollof rice, and Porridge (Pap/Akamu) are culturally significant staples that are consumed in distinctly different ways compared to Western cereals and grains. By analysing these foods separately, it was possible to more accurately reflect the dietary practices unique to this demographic, thereby providing insights into how traditional African foods are integrated into participants' diets alongside Western items. Furthermore, employing PCA on these distinct food groups allowed for the identification of more refined dietary patterns, which could have been obscured if these categories were aggregated. The exploratory nature of PCA, which captures underlying structures based on inter-correlations, was leveraged to discern patterns with potential health implications; for instance, a higher intake of whole grains was observed to correlate with more favourable health markers, whereas patterns characterised by refined cereals might reveal different health associations (Newby & Tucker, 2004; Smith et al., 2011). This methodological approach ensured a rigorous and contextually relevant examination of dietary behaviours facilitating a deeper understanding of diet-health relationships within this population.

Before conducting PCA, the suitability of the data for factor analysis was tested using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity. The results indicated that factor analysis was appropriate for this dataset, supporting the factorability of the correlation matrix with a significant Bartlett's Test result ($\chi^2 = 1416.470$, $df = 171$, $p < 0.001$) and a high KMO value of 0.854, which is above the threshold of 0.5, and classified as 'meritorious' to 'marvelous' according to (Kaiser, (1974)). A scree plot was generated to determine the number of factors to retain, applying the eigenvalue-one criterion. Two key selection criteria were followed: (1) the Kaiser-Guttman rule, which retains factors with eigenvalues greater than 1.0, and (2) the bend elbow rule derived from the scree plot, which identifies the point when the slope of the plot changes (Pallant, 2020). An orthogonal rotation (Varimax) was employed to simplify the factor structure, presuming that the factors were uncorrelated. A minimal factor loading criteria of 0.3 was set to identify food groups that significantly contributed to the extracted dietary patterns. While previous studies employed lower thresholds, such as 0.2 (Smith et al., 2013), statistical recommendations suggested that a cut-off of 0.3 would yield more robust factor loadings (Pallant, 2020).

To examine differences between socio-demographic characteristics and dietary intake, ANCOVA tests were initially proposed, using socio-demographic factors as independent variables and food intake as the dependent variable. However, the data violated key ANCOVA assumptions, specifically that residuals should be normally distributed within each category of the independent variables and that variances should be homogeneous across groups (Field, 2024; Laerd Statistics, n.d.). Efforts to address these violations by logarithmic data transformation were unsuccessful. Consequently, non-parametric tests were employed, with adjustments for potential confounding variables. The Mann-Whitney U test was first employed for dichotomous

independent variables (marital status and migration status), then followed by Kruskal-Wallis tests for independent variables with more than two categories. A non-parametric ANCOVA (Quade's) was performed to control for the effects of age and BMI by running a linear regression on dietary intake variables, followed by an analysis of the residuals using Kruskal-Wallis tests to evaluate socio-demographic differences.

To test the associations between sociodemographic factors and dietary patterns, MANCOVA tests were performed, controlling for age and BMI. Firstly, multivariate normality was evaluated for each dietary score across the sociodemographic groups, and the data was considered normal according to the Shapiro-Wilk test. Additional preliminary assumption testing for linearity, univariate and multivariate outliers, homogeneity of variance, covariance matrices, and multicollinearity revealed no serious violations. Discriminant function analysis was conducted subsequent to the identification of significant connections by the MANCOVAs (Field, 2024, p.811).

Table 5.1. Food groupings used in the dietary pattern analysis of the modified EPIC FFQ

#	Food group	Definition and content
1	Dairy products and eggs	Single or sour cream, double or clotted cream, low fat yogurt, fromage frais, full fat or Greek yogurt, dairy desserts, cheese, quiche, eggs
2	Meat total	Beef, beef burgers, pork, lamb, liver, bacon, ham, processed meats, sausages, chicken, goat,
3	White meat	Chicken or other poultry
4	Red meat	Beef, beefburgers, goat meat, cow leg, cow tail, pork, lamb, meat soup
5	Processed meat	Bacon, ham, corned beef, spam, luncheon meats, sausages, savoury pies, sausage rolls, liver, liver paté, liver sausage
6	Fish	Fried fish, fish fingers, fish cakes, White fish, other White fish, oily fish, shellfish, fish roe, taramasalata
7	Vegetables	Carrots, spinach (efo) or ugu, okazi, eru, bitter leaf, broccoli, spring greens, kale, brussels sprouts, cabbage, marrow, courgettes, cauliflower, parsnips, turnips, swedes, leeks, onions, garlic, mushrooms, sweet peppers, beansprouts, green salad, lettuce, cucumber, celery, watercress, tomatoes, sweetcorn, beetroot, coleslaw, avocado, tofu, soya meat, tvp, vegeburger
8	Fruits	Apples, pears, oranges, satsumas, mandarins, grapefruit, bananas, grapes, watermelon or melon, peaches, plums, apricots, strawberries, raspberries, kiwi fruit, tinned fruit, dried fruits
9	Legumes and Nuts	Peas, green beans, broad beans, runner beans, peanuts or other nuts or kuli kuli, baked beans, dried lentils, beans, peas, akara, moi moi, beans porridge
10	Whole grains	White rice, jollof rice, fried rice, brown rice
11	Cereals	Porridge, oatmeal, readybrek, pap/akamu, breakfast cereal
12	Bread	White bread, African bread, rolls, brown bread and rolls, wholemeal bread and rolls, crispbread
13	Potatoes and pasta	Boiled, mashed, instant or jacket potatoes, chips, roast potatoes, potato salad, White or green pasta, macaroni, noodles, boiled yam, yam, fufu, garri/eba, pounto yam, semovita or semolina, banku, kenkey, amala, wholemeal pasta, lasagne, moussaka, pizza
14	Sweets	Sweet biscuits, chocolate, sweet biscuits, plain, cakes home baked, cakes ready made, buns, pastries home baked, buns, pastries ready made, fruit pies, tarts, crumbles, home baked, fruit pies, tarts, crumbles, ready made, sponge puddings, home baked, sponge puddings, ready made, milk puddings, ice cream, choc ices, chocolates, single or squares, chocolate snack bars, sweets, toffees, mints, sugar added to tea, coffee, cereal, crisps or other packet snacks, cream crackers, cheese biscuits
15	Sweetened drinks	Tea, coffee, instant or ground, coffee, decaffeinated, coffee Whitener, cocoa, hot chocolate, horlicks, ovaltine, milo, malt or

		malta guinness, low calorie or diet fizzy soft drinks, fizzy soft drinks, pure fruit juice, fruit squash or cordial
16	Alcoholic drinks	Wine, beer, liquors, spirits
17	Animal fats	Salad cream, mayonnaise, Butter
18	Vegetable oils and fats	Butter, margarine, polyunsaturated margarine, other margarine, low fat spread, mayonnaise, low calorie mayonnaise, French dressing, salad dressing
19	Mixed/composite dishes	Vegetable soups and other soups, and sauces

5.6 Ethical Approval

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and was approved by the research ethics committees at St Mary's University on the 2nd of August 2022, SMU_ETHICS_2021-22_368 and 8th of November 2023 following a request for an extension for data collection (Appendix 3). Each participant who completed the questionnaires manually gave written informed consent and implied consent via the online survey.

5.7 Results

5.7.1 Study Participants Socio-Demographic Characteristics

A total of 112 Black African women were included in the final analysis (Table 5.2). Most participants were aged 25-44 years (54.5%), with a notable proportion in the 45-60 years age group (38.4%). The majority of participants hailed from Nigeria (65.2%), followed by Ghana (24.1%) and Cameroon (10.7%). Marital status revealed that 71.4% were either married or in a civil partnership. The vast majority of participants were first-generation immigrants (70.5%), with most of them having lived in the UK for over 20 years (35.7%). Employment statistics show that more than half of the participants were engaged in full-time employment (52.7%), while a substantial number were employed part-time (33.9%). The educational background of the cohort

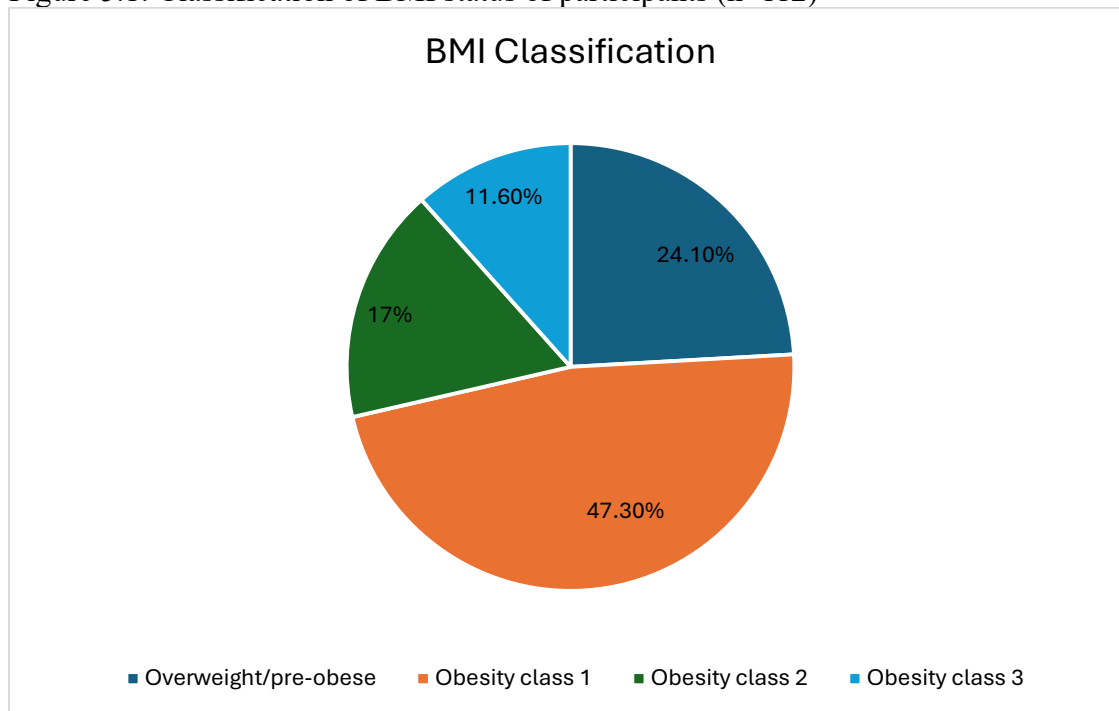
was primarily at the diploma or university degree level (59.8%), and the income distribution indicated that the largest group earned between £20,000 and £39,000 (53.6%) (Table 5.2). The BMI classification of participants is shown in Figure 5.1.

Table 5.2 Characteristics of study participants (n=112)

Characteristics	Level	<i>n</i>	%
Age group (years)	25-44	61	54.5
	45-60	43	38.4
	65-75	8	7.1
Country of origin	Nigeria	73	65.2
	Ghana	27	24.1
	Cameroon	12	10.7
married or living with common-law partners	Yes	80	71.4
	No	32	28.6
Migration status	First generation	79	70.5
	Second generation	33	29.5
Length of stay in the UK	<5 years	35	31.3
	5-10 years	11	9.8
	11-15 years	10	8.9
	16-20 years	16	14.3
	>20 years	40	35.7
Employment status	Full time	59	52.7
	Part time	38	33.9
	Retired	6	5.4
	Unemployed	9	8.0
Level of education	Diploma or university degree	67	59.8
	Some college or university	30	26.8
	High school	4	3.6
	Did not finish high school	8	7.1
	None	3	2.7
Level of income	Less than 20,000	23	20.5
	20,000- 39,000	60	53.6
	More than 40,000	29	25.9

NB: n=number of participants.

Figure 5.1: Classification of BMI status of participants (n=112)



5.7.2 Food Group Consumption Analysis Among Black African Women in the UK

The median intakes of 19 food groups by Black African women in the UK is given in Table 5.3.

Participants had a high median intake of vegetables and fruits, each approximately 370 grams per day. Whole grains and potatoes/pasta were also prominently consumed, with medians of 388 grams and 295 grams per day, respectively. In terms of protein sources, red meat was the most consumed, with a median intake of 150 grams per day. White meat and fish were consumed at lower levels, with medians of 52 grams and 73 grams per day, respectively. Legumes and nuts were included in the diet, with a median intake of 67 grams per day. Dairy products and eggs had a median intake of 43 grams per day, while sweets were consumed at a median of 70 grams per day. The median intake of sweetened drinks was 263 grammes per day. Alcoholic drinks and animal fats were taken in in lesser amounts, with medians of 9 grammes and 6 grammes per day,

respectively. Furthermore, the median daily intakes of processed meats and mixed or composite foods, including soups and sauces, were 24 grammes and 139 grammes, respectively.

Table 5.3 Food group consumption in Black African women in UK (grams per day)

Food group	Median	IQR	Min	Max
Whole grains	388	518.52	33	1321
Vegetables	370	635.34	33	3442
Fruits	368	591.9	0	2085
Potatoes and Pasta	295	394.65	38	1498
Sweetened drinks	263	540.1	0	1489
Meat total	235	462.04	22	1654
Red meat	150	315.58	0	1140
Mixed/composite dishes (soups and sauces)	139	183.06	16	771
Fish	73	137.4	0	1664
Sweets	70	156.21	0	1238
Legumes and Nuts	67	133.73	6	821
White meat	52	78	8	540
Dairy products and eggs	43	107.85	0	616
Cereals	30	84.9	0	504
Bread	30	80.92	0	1112
Processed meat	24	51.15	0	1248
Alcoholic drinks	9	67.97	0	640
Vegetables oils and fats	8	19.35	0	233
Animal fats	6	12.09	0	146

IQR: interquartile range

5.7.3 Nutrient Intakes Assessment

5.7.3.1 *Nutrient Consumption of Black African Women*

The macronutrient intake among Black African women in the UK was assessed, and the results are summarised in Table 5.4. The mean daily energy intake was 3126 ± 221 kcal. Protein intake had a mean of 243 ± 20 grams per day. Mean carbohydrate intake was 729 ± 35 grams per day. The intake of total sugars was 226 ± 8 grams per day. Dietary fibre intake averaged 58 ± 5 grams per day. The mean total fat intake was 188 ± 54 grams per day. Within this category, the mean intake of saturated fatty acids was 63 ± 3 grams per day, monounsaturated fatty acids averaged 98 ± 5 grams per day, and polyunsaturated fatty acids had a mean intake of 64 ± 4 grams per day. Cholesterol intake had a mean of 750 ± 60 mg per day (Table 5.4).

Table 5.4 Macronutrient Intake Among Black African Women in the UK by age group

Macronutrients	Total (n=112)	25-44 years (n=61)	45-64 years (n=43)	65-75 years (n=8)	UK DRV (%TE or value)	% meeting DRV ^a
Energy (kcal/day) ^b	3126 ± 221	3042± 215	3156± 223	3213± 241	-	
Protein (g/day) ^c	243 ± 20	245±20	247±20	241±19		
% of TE as protein ^d	31%	32%	31%	28%	≥ 10% TE	100%
Carbohydrate (g/day) ^e	729 ± 35	728±35	744±36	753±36	< 267g/day	0%
Sugars (g/day) ^f	226 ± 8	224±34	230±36	232±36		
% of TE as sugar ^g	29%	30%	29%	27 %	< 5% TE	0%
Fiber (g/day) ^h	58 ± 5	59 ± 6	52 ± 6	56 ± 5	≥ 30g/day	100%
Fat (g/day) ⁱ	188 ± 54	177±51	178±51	200±57		
% of TE as fat ^j	54%	52%	51%	53%	≤ 35% TE	0%
Fatty acids, saturated (g/day) ^k	63 ± 3	54 ± 4	59 ± 3	64 ± 4		
% of TE saturated fat ^l	18%	16%	17%	17%	11% TE	0%
Fatty acids, total MUFA (g/day) ^m	98 ± 5	92 ± 7	86 ± 6	97 ± 6		
% of TE as MUFA ⁿ	28%	27%	25%	26%	13%TE	-
Fatty acids, total PUFA (g/day) ^o	64 ± 4	57 ± 5	61 ± 5	65 ± 5		
% of TE as PUFA ^p	18%	17%	17%	17%	6.5%	-
Cholesterol (mg/day) ^q	750 ± 60	725 ± 70	755 ± 65	764 ± 68	< 300 mg/d	0%

TE = total energy, MUFA = monounsaturated fat, PUFA = polyunsaturated fat

^a Using the Estimated Average Requirement (EAR) cut-point method where applicable. EAR cut-point not applicable for energy or %TEI calculations.

^b Energy figures were derived from SACN Dietary Reference Values (DRV) for Energy (2015)

^c Protein figures were obtained from DRV for Food Energy and Nutrients for the United Kingdom (1991).

^d The DRV for protein is calculated as 10% food energy taken from FAO/WHO, 2003

^e Carbohydrate figures were calculated using the energy figures from SACN DRV for Energy (2011).

^f The DRV for sugar are taken from SACN, 2011.

^g The DRV for sugar is calculated as 5% food energy taken from SACN, 2015

^h The DRV for fibre are taken from SACN, 2015

ⁱ The DRV for fat taken are from SACN, 2015.

^j The DRV for fat is calculated as 35% food energy taken from DRV for Food Energy and Nutrients for the United Kingdom (1991)

^k The DRV for saturated fat is calculated as 11% food energy taken from DRV for Food Energy and Nutrients for the United Kingdom (1991)

ⁿ The DRV for monosaturated fat is calculated as 13% food energy taken from DRV for Food Energy and Nutrients for the United Kingdom (1991)

^o The DRV for polysaturated are taken from SACN, 2015.

^p The DRV for polysaturated fat is calculated as 6.5% food energy taken from DRV for Food Energy and Nutrients for the United Kingdom (1991)

^q The DRV for cholesterol are taken from COMA, 1991.

The micronutrient analysis of individuals revealed higher intake of several vitamins and minerals relative to the recommended dietary reference values (DRV) for the general population (Table 5.5). The average intake of Vitamin A was 1277 ± 125 $\mu\text{g/day}$. The average intakes of B-vitamins were Thiamin at 2 ± 0 mg, Riboflavin at 2 ± 0 mg, and Vitamin B6 at 6 ± 0 mg. Essential mineral consumption showed Calcium at 1334 ± 67 mg, Magnesium at 7778 ± 42 mg, and Potassium at 8117 ± 536 mg. The average sodium intake was 8891 ± 545 mg.

Table 5.5 Micronutrient Intake Among Black African Women in the UK

Micronutrients	Mean $\pm$ SD	UK DRV
Vitamin A, (ug/day)	1277 $\pm$ 125	600 for 19-64 y 600 for 65-74 y 600 for 75+ y
Thiamin (mg)	2 $\pm$ 0	0.8 for 19-64 y 0.8 for 65-74 y 0.7 for 75+ y
Riboflavin (mg)	2 $\pm$ 0	1.1 for 19-64 y 1.1 for 65-74 y 1.1 for 75+ y
Niacin (mg)	29 $\pm$ 4	13.2 for 19-64 y 12.6 for 65-74 y 12.1 for 75+ y
Vitamin B-6 (mg)	6 $\pm$ 0	1.2 for 19-64 y 1.2 for 65-74 y 1.2 for 75+ y
Folate, (ug)	1136 $\pm$ 78	200 for 19-64 y 200 for 65-74 y 200 for 75+ y
Vitamin B-12 (mcg)	15 $\pm$ 2	2.4 for 19-64 y 2.4 for 65-74 y 2.4 for 75+ y
Vitamin C (mg)	85 $\pm$ 49	40 for 19-64 y 40 for 65-74y 40 for 75+ y
Vitamin D (mcg)	11 $\pm$ 2	10 for 19-64 y 10 for 65-74 y 10 for 75+ y
Calcium (mg)	1334 $\pm$ 67	700 for 19-64 y 700 for 65-74 y 700 for 75+ y
Magnesium (mg)	778 $\pm$ 42	270 for 19-64 y 270 for 65-74 y 270 for 75+ y
Zinc (mg)	36 $\pm$ 4	7.0 for 19-64 y 7.0 for 65-74 y 7.0 for 75+y
Copper (mg)	4 $\pm$ 0	1.2 for 19-64 y 1.2 for 65-74 y 1.2 for 75+ y
Selenium (mcg)	310 $\pm$ 22	60 for 19-64 y 60 for 65-74 y 60 for 75+ y
Potassium (mg)	8117 $\pm$ 536	3500 for 19-64 y 3500 for 65-74 y 3500 for 75+ y
Sodium (mg)	8891 $\pm$ 545	2400 for 19-64 y 2400 for 65-74 y 2400 for 75+ y

5.7.3.2 Socio-Demographic Determinants of Dietary Intakes of Black African Immigrant Women in the UK

A Mann-Whitney U test was conducted to evaluate differences in nutrient intake between groups defined by dichotomous variables (Table 5.6) The nutrient intake distributions for women who were either married or with partners versus those who were single were visually inspected and found to be dissimilar (Pallant, 2020). However, there was no significant difference in energy intake based on marital status, with single women having a median intake of 3030 kcal (IQR = 2775-3347) and women who were married or with partners having a median intake of 3159 kcal (IQR = 2857-3384; $p = 0.228$). Similarly, no significant differences were found in the median intakes of protein, carbohydrate, sugars, and fats between the two groups ($p > 0.05$). The migration status showed significant difference in median intakes of energy, carbohydrate, and sugar. Second-generation migrants showed higher median energy intake (3379 kcal, $p < 0.001$), carbohydrate intake (749 g, $p = 0.017$), and sugar intake (232 g, $p < 0.001$), in contrast to first-generation migrants, who demonstrated lower values in these nutritional categories. There were no significant differences in protein and fat intake between the two migration groups. After controlling for age and BMI, these significant differences remained for energy ($U = 1839$, $p < 0.001$), carbohydrate ($H = 1619$, $p = 0.044$), and sugar intake ($U = 2081$, $p < 0.001$) (Table 5.6).

Table 5.6 Mann Whitney U tests for differences between nutrient intakes and socio-demographic variables

Nutrient Intake categories	Factor	Groups	Median Intake (IQR)	U	Z	p-value
Total energy (kcal/day)	Marital Status	Married	3030 (2775-3347)	1467.00	1.204	0.228
		Unmarried	3159 (2857-3384)			
	Migration Status	First generation	2987 (2766-3186)	1839.00	2.418	<0.0001
		Second generation	3379 (3009-3400)			
Total protein (g/day)	Marital Status	Married	245 (226-255)	1252.50	-0.177	0.859
		Unmarried	246 (222 -255)			
	Migration Status	First generation	244 (224-254)	1478.50	1.117	0.264
		Second generation	248 (235 -256)			
Total Carbohydrate (g/day)	Marital Status	Married	739 (689-757)	1435.50	1.002	0.317
		Unmarried	745 (691-763)			
	Migration Status	First generation	737 (684-756)	1619.00	2.014	0.044
		Second generation	749 (725-765)			
Total Sugar (g/day)	Marital Status	Married	226(221-231)	1528.00	1.597	0.110
		Unmarried	231 (221-235)			
	Migration Status	First generation	223 (218-231)	2081.00	4.962	<0.001
		Second generation	232 (230-235)			
Total Fat (g/day)	Marital Status	Married	178 (145-233)	1378.50	0.634	0.526
		Unmarried	184 (140-256)			
	Migration Status	First generation	176 (144-234)	1430.00	0.807	0.419
		Second generation	182 (149-252)			

NB: U= Mann Whitney U. Z= Standardized test statistic. P Value= statistical sig. <0.05. All values are median intakes unless otherwise stated. Interquartile range (25%-75%). n= number of participants.

For length of stay, participants staying 5–10 years and over 20 years showed significantly higher energy intake ($p = 0.002$) (median intakes 3332 kcal and 3272 kcal, respectively), compared to those staying less than 5 years (MED=2901 kcal). Carbohydrate intake was significantly different by country of origin ($p = 0.028$), with Cameroonians having the highest median intake (MED = 747g) compared to Nigerians and Ghanaians. Similarly, sugar intake was significantly different by years of residence in the UK ($p < 0.001$); participants who had lived in the UK for more than 20 years had a higher median sugar intake (MED = 749g) than those with shorter residency durations. After adjusting for age and BMI, the significance for energy intake ($H = 13.812$, $p = 0.008$) and sugar intake ($H = 37.898$, $p < 0.001$) remained; however, the significance

for carbohydrate intake did not persist ($H = 8.089$, $p = 0.088$). Post-hoc pairwise analysis revealed that participants who had stayed in the UK for over 20 years had significantly higher total energy intake compared to those who had stayed for 11–15 years (Table 5.7).

Significant differences in energy ($p = 0.006$) and intakes of carbohydrates ($p = 0.018$) were noted across education levels, with participants without formal education reporting the highest intake (3303 kcal) comparison to all the other groups. The sugar intake also showed a significant difference ($p = 0.013$), with women with some college education reporting the highest median intake (231 g). Protein and fat intakes were not significantly different based on education level. After adjusting for age and BMI, significant differences remained for energy intake ($H = 11.592$, $p = 0.021$), though carbohydrate ($H = 8.722$, $p = 0.068$) and sugar intake ($H = 8.819$, $p = 0.066$) no longer showed significant differences. Post-hoc analysis revealed that participants having a diploma or university degree displayed significantly lower total energy intakes than those with some college education (MED = 2946 kcal vs. 3178 kcal, $p = 0.007$) and those without formal education (MED = 2946 kcal vs. 3303 kcal, $p = 0.040$).

For country of origin, there were significant differences in energy ($p = 0.035$), carbohydrate ($p = 0.010$), and fat intakes ($p = 0.011$), with participants from Cameroon consistently showing the highest median values (MED=3387 kcal, 747 g, 177.50g, respectively), compared to all other groups. No significant differences were observed in protein ($p = 0.411$) and sugar intake ($p = 0.373$). After controlling for age and BMI, significant differences remained in carbohydrate ($H = 7.132$, $p = 0.028$) and fat intake ($H = 6.917$, $p = 0.031$); however, the significance for total energy intake was lost ($H = 5.602$, $p = 0.061$). Post-hoc analysis demonstrated significant differences between Nigeria and Ghana, with Ghana having higher carbohydrate ($p = 0.023$) and fat intake ($p = 0.039$). Significant differences in intake of energy ($p = 0.010$) were seen across BMI

categories, with women classified as Obese 3 showing the highest median intake. However, protein ($p = 0.184$), carbohydrate ($p = 0.196$), sugar ($p = 0.593$), and fat intakes ($p = 0.126$) were not significantly different across BMI groups. After adjusting for covariates, significant differences in energy intake did not remain ($H=6.923$, $p=0.074$) (Table 5.7).

Table 5.7 Kruskal-Wallis H test for nutrient intakes and sociodemographic characteristics after adjusting for covariates (n=112)

Variable	Factor	Groups	Median (IQR)	H	df	p-value
Total energy (kcal/day)	Country of origin	Nigeria	3139 (2759.82-3313.02)	5.602	2	0.061
		Ghana	3156 (2784.53-3378.81)			
		Cameroon	3387 (3027.74-3407.32)			
	Years of Stay	<5years	2901 (2736.63-3295.82)	13.812	4	0.008
		5-10 years	3332 (3212.55-3419.25)			
		11- 15 years	2902 (2746.00-3002.99)			
		16-20 years	3124 (2867.27-3183.62)			
		>20 years	3272 (3337.57-3396.33)			
	Education	Diploma or degree	2946 (2750.96-3312.38)	11.592	4	0.021
		Some	3178 (2940.85-3321.49)			
		High school	3068 (3006.61-3173.51)			
		Did not	3141 (3103.69-3342.07)			
		None	3303 (3378.81-3343.12)			
	Age group	25-44years	3065 (2722.11-3332.29)	5.057	2	0.080
		45-64years	3170 (3038.96-3327.34)			
		65-75years	3265 (2740.19-3303.12)			
	Employment	Full time	3015 (2754.06-3377.17)	2.656	3	0.448
		Part time	3131 (2857.32-3331.96)			
		Retired	3343 (2869.46-3346.69)			
		Unemployed	3097 (2967.40-3339.86)			
	Income	<20	2987 (2694.98-3318.70)	3.301	2	0.192
		30-39	3110 (2777.78-3347.34)			
		>=40	3136 (2942.52-2578.34)			
	BMI Classification	Overweight	2193 (2771.97-3176.25)	6.923	3	0.074
		Obese 1	3050 (2759.82-3379.16)			
		Obese 2	3097 (2766.94-3118.70)			
		Obese 3	3346 (2352.16-3347.33)			
Total protein (g/day)	Country of origin	Nigeria	245 (225.03-255.70)	1.366	2	0.505
		Ghana	239 (223.45-253.62)			
		Cameroon	248 (237.88- 258.61)			
	Years of Stay	<5years	232 (224.92-252.01)	5.786	4	0.216
		5-10 years	245 (214.18-259.67)			
		11- 15 years	240 (220.38-244.52)			
		16-20 years	249 (223.97-256.12)			
		>20 years	249 (235.40-256.39)			

Total Carbohydrate (g/day)	Education	Diploma or degree	245 (226.30-255.63)	4.494	4	0.343
		Some	247 (222.70-254.01)			
		High school	256 (246.04-262.79)			
		Did not	234 (216.56-249.75)			
		None	241 (239.13-240.85)			
	Age group	25-44years	245 (224.60- 253.07)	0.596	2	0.742
		45-64years	247 (225.13- 257.13)			
		65-75years	241 (226.10- 255.58)			
	Employment	Full time	247 (225.13-256.86)	3.090	3	0.378
		Part time	243 (221.49-250.51)			
		Retired	239 (225.73-255.58)			
		Unemployed	239 (225.83-255.11)			
	Income	<20	244 (226.99-252.01)	2.280	2	0.320
		30-39	245 (223.05-253.49)			
		>=40	250 (225.33-260.67)			
	BMI Classification	Overweight	250 (234.28-257.13)	5.061	3	0.167
		Obese 1	243 (223.28-250.56)			
		Obese 2	248 (223.45-261.67)			
		Obese 3	236 (220.16-254.75)			
	Country of origin	Nigeria	731 (683.76-749.67)	7.132	2	0.028
		Ghana	736 (735.09-762.84)			
		Cameroon	747 (729.81-769.30)			
	Years of Stay	<5years	722 (681.46-756.89)	8.089	4	0.088
		5-10 years	748 (739.42-758.38)			
		11- 15 years	697 (679.17-743.93)			
		16-20 years	741 (682.62-747.47)			
		>20 years	749 (723.71-763.39)			
	Education	Diploma or degree	725 (638.52-749.24)	8.722	4	0.068
		Some	740 (731.91-765.49)			
		High school	756 (711.45-765.53)			
		Did not	762 (698.79-766.67)			
		None	763 (748.92-762.55)			
	Age group	25-44years	728 (683.52- 757.60)	4.955	2	0.084
		45-64years	744 (721.74- 759.64)			
		65-75years	753 (730.58- 764.22)			
	Employment	Full time	736 (688.25-755.82)	4.243	3	0.236
		Part time	740 (683.52-761.96)			
		Retired	749 (743.16-767.78)			

Total Sugar (g/day)	Income	Unemployed	748 (719.74-763.45)	0.718	2	0.698
		<20	738 (679.76-750.09)			
		30-39	739 (690.16-761.63)			
		>=40	739 (715.38-750.63)			
	BMI Classification	Overweight	737 (683.50-758.30)	5.426	3	0.143
		Obese 1	736 (683.86-757.90)			
		Obese 2	738 (689.93-761.76)			
		Obese 3	753 (741.21-765.13)			
	Country of origin	Nigeria	225 (220.03-233.38)	1.590	2	0.452
		Ghana	229 (220.03-231.77)			
		Cameroon	231 (224.97-233.63)			
	Years of Stay	<5years	221 (215.40-223.71)	37.898	4	<0.001
		5-10 years	223 (220.23-227.65)			
		11- 15 years	222 (214.23-227.47)			
		16-20 years	231 (228.08-235.49)			
		>20 years	232 (230.89-234.56)			
	Education	Diploma or degree	230 (217.33-231.90)	8.819	4	0.066
		Some	231 (225.36-233.21)			
		High school	228 (222.87- 233.13)			
		Did not	231 (224.64-235.03)			
		None	228 (225.73-228.28)			
	Age group	25-44years	224 (218.17- 232.09)	0.767	2	0.682
		45-64years	230 (222.23- 233.58)			
		65-75years	232 (226.93- 238.00)			
Total Fat (g/day)	Employment	Full time	226 (221.27-234.03)	4.960	3	0.175
		Part time	224 (219.73-231.21)			
		Retired	231 (230.07-234.50)			
		Unemployed	228 (223.84-233.92)			
	Income	<20	224 (219.17-233.17)	5.638	2	0.060
		30-39	224 (218.87-231.72)			
		>=40	231 (224.33-234.39)			
	BMI Classification	Overweight	224 (219.66-231.53)	1.077	3	0.783
		Obese 1	230 (221.37-233.25)			
		Obese 2	224 (216.76-232.27)			
		Obese 3	225 (217.97-234.20)			
	Country of origin	Nigeria	167 (134.00-216.50)	6.917	2	0.031
		Ghana	219 (172.00-256.00)			
		Cameroon	178 (165.00-269.75)			

Years of Stay	<5years	167 (140.00-223.00)	2.596	4	0.628
	5-10 years	173 (140.00-199.00)			
	11- 15 years	189 (150.00-252.25)			
	16-20 years	207 (117.75- 260.25)			
	>20 years	181 (149.75-255.75)			
Education	Diploma or degree	175 (140.00-221.00)	2.004	4	0.735
	Some	192 (145.75-256.00)			
	High school	184 (142.00-247.50)			
	Did not	204 (134.00-263.25)			
	None	210 (157.00-210.00)			
Age group	25-44years	177 (149.00- 238.00)	0.231	2	0.891
	45-64years	178 (135.00- 255.00)			
	65-75years	200 (136.00- 246.75)			
Employment	Full time	178 (140.00-242.00)	1.318	3	0.725
	Part time	178 (154.00-251.00)			
	Retired	190 (147.75-261.75)			
	Unemployed	175 (143.50-199.50)			
Income	<20	173 (144.00-218.00)	2.019	2	0.364
	30-39	190 (152.00-255.00)			
	>=40	177 (134.00-219.00)			
BMI Classification	Overweight	165 (128.00-204.00)	5.808	3	0.121
	Obese 1	182 (150.50-249.00)			
	Obese 2	191 (144.00-255.00)			
	Obese 3	199 (169.50-262.50)			

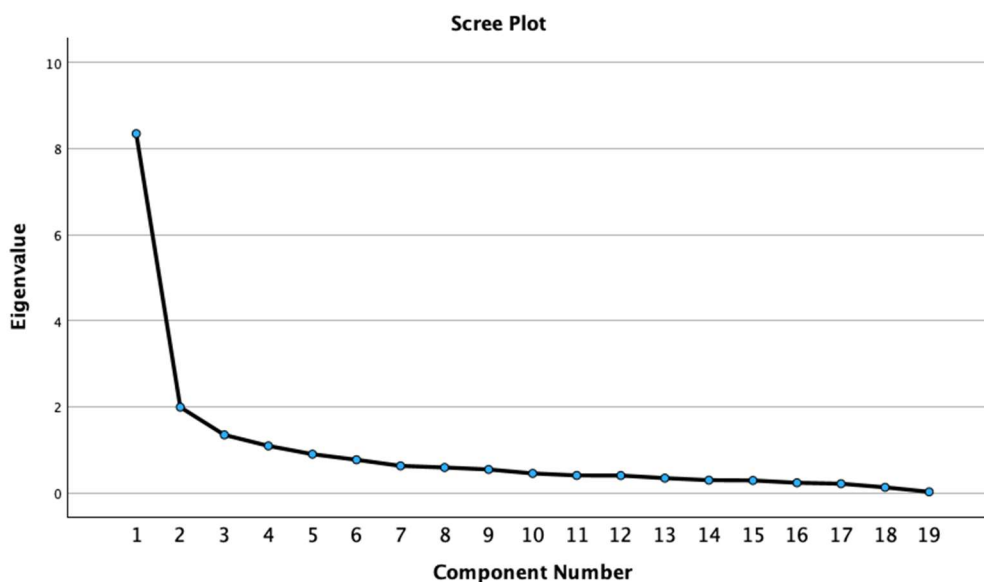
NB: All values are median intakes unless otherwise stated. Interquartile range (25%-75%). BMI=Body Mass Index. Covariates= age and BMI. Kruskal Wallis H significant at $p<0.05$

5.7.4 Dietary Patterns of Black African Immigrant Women in the UK

A PCA on 19 food groups was conducted to analyse the habitual food intake of 112 Black African women. The sample size met the widely accepted criteria of having at least 5 to 10 observations per variable for conducting a reliable PCA (Laerd Statistics, n.d.; Tabachnick et al., 2013).

PCA showed four components with eigenvalues greater than 1, explaining 43.9%, 10.5%, 7.1%, and 5.7% of the total variance, respectively. Visual inspection of the scree plot (Figure 5.2) also revealed four components should be retained (Cattell, 1966). Additionally, the four-component solution met the interpretability criterion. Therefore, these four components were retained, and a forced factor extraction was performed. The four-component solution explained 67.3% of the total variance. To aid interpretation, an orthogonal (varimax) rotation was performed. The rotated solution revealed several high positive factor loadings (Table 5.8).

Figure 5.2: PCA Scree plot of Eigenvalues for each component number



The first component in the rotated structure matrix could be described as a “Western dietary pattern”, with high positive loadings (> 0.3) for sweets (0.764), alcohol (0.744), animal fat (0.733), processed meat (0.679), vegetable fats (0.612), dairy and eggs (0.607), legumes (0.565), potatoes and pasta (0.469), and sweetened drinks (0.356). There was a negative loading for White meat (-0.407) (Table 5.8). The second component had high positive loadings (> 0.3) for processed meat (0.310), legumes (0.383), whole grains (0.822), potatoes and pasta (0.698), bread (0.671), fish (0.644), cereals (0.529), vegetables (0.371), mixed dishes (0.390), total meat (0.338), and White meat (0.465), with no negative loadings greater than -0.3 (Table 5.8). This pattern was described as an "African-style dietary pattern". The third component was characterised by high positive loadings (> 0.3) for legumes (0.525), cereals (0.309), fruits (0.822), sweetened drinks (0.626), vegetables (0.614), and mixed dishes (0.567), with no negative loadings greater than -0.3 (Table 5.8). This pattern was described as a "Plant-Based and Sugar dietary pattern." The fourth component, described as "Meat-Centric pattern," showed significant positive loadings (> 0.3) for processed meat (0.436), total meat (0.879), red meat (0.867), and white meat (0.572), with no negative loadings greater than -0.3 (Table 5.8).

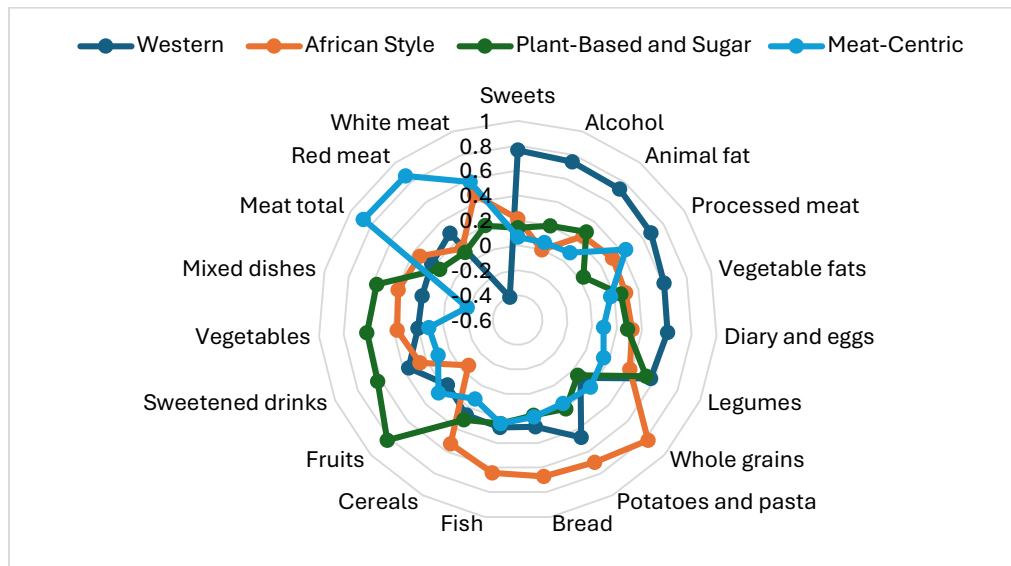
Table 5.8 Rotated component loadings derived from PCA with Varimax rotation for dietary variables that constitute the four main dietary patterns identified.

Food Group	Principal Component (Dietary Pattern)			
	C1	C2	C3	C4
Sweets	0.764	0.214	0.140	0.067
Alcohol	0.744	-0.004	0.200	0.058
Animal fat	0.733	0.255	0.298	0.084
Processed meat	0.679	0.310	0.030	0.436
Vegetable fats	0.612	0.293	0.253	0.170
Diary and eggs	0.607	0.322	0.284	0.091
Legumes	0.565	0.383	0.525	0.152
Whole grains	0.085	0.822	0.054	0.194
Potatoes and pasta	0.469	0.698	0.209	0.162
Bread	0.268	0.671	0.174	0.188
Fish	0.273	0.644	0.241	0.241
Cereals	0.265	0.529	0.309	0.121
Fruits	0.166	-0.065	0.822	0.263
Sweetened drinks	0.356	0.256	0.626	0.097
Vegetables	0.202	0.371	0.614	0.116
Mixed dishes	0.190	0.390	0.567	-0.183
Meat total	0.224	0.338	0.146	0.879
Red meat	0.285	0.127	0.090	0.867
White meat	-0.407	0.465	0.202	0.572

NB: Major loadings for each item are bolded and presented in red (factor loadings > 0.3 or < -0.3 are considered significant). Extraction method: Principal component analysis. Rotation method: Varimax. C1= Western dietary pattern; C2=African style dietary pattern; C3= Plant-based and sugar dietary pattern; C4= Meat-centric dietary pattern

The component scores for each dietary pattern were inputted into a radar graph to provide a visual interpretation of the differences between the four dietary patterns produced through PCA (Fig. 5.3).

Figure 5.3: Radar graph of dietary patterns and factor loadings derived through PCA on 19 FFQ food groups (n = 112)



NB: Dark blue = the ‘Western’ dietary pattern (DP1); orange line = the ‘African style’ pattern (DP2); green line = the ‘Plant-based and sugar’ pattern (DP3); blue line = the ‘Meat-Centric’ pattern (DP4).

5.7.4.1 Socio-Demographic Determinants

MANCOVA was performed to examine the differences between sociodemographic factors and dietary patterns. The initial model incorporated age and BMI as covariates, with four dietary pattern scores as dependent variables and socio-demographic factors—including country of origin, marital status, migration status, length of stay, employment status, educational level, income, and age group—as independent variables. Although age and BMI did not significantly affect the outcomes, the models incorporating these factors are shown, offering a more comprehensive analysis. Significant differences found by MANOVAs were subsequently examined using discriminant function analysis (Field, 2024, p.811). Table 5.9 presents the descriptive statistics for all factors categorised by dietary pattern.

Table 5.9 Descriptive statistics of dietary patterns across sociodemographic factors (mean $\pm$ SD)

Characteristics	Western DP	African style DP	Plant-based and sugar DP	Meat-centric DP
Age group				
25-44years	-0.056 $\pm$ 0.980	0.262 $\pm$ 0.925	0.102 $\pm$ 0.974	0.049 $\pm$ 0.977
44-60years	0.126 $\pm$ 1.010	-0.291 $\pm$ 1.050	-0.091 $\pm$ 1.024	-0.072 $\pm$ 1.050
60-75years	0.360 $\pm$ 1.150	-0.430 $\pm$ 0.757	-0.288 $\pm$ 1.097	0.0153 $\pm$ 1.002
Country of Origin				
Nigeria	-0.297 $\pm$ 0.885	0.061 $\pm$ 0.895	-0.067 $\pm$ 0.100	-0.002 $\pm$ 0.965
Ghana	0.402 $\pm$ 0.974	0.057 $\pm$ 1.154	0.048 $\pm$ 0.856	0.003 $\pm$ 1.077
Cameroon	0.899 $\pm$ 0.930	-0.502 $\pm$ 1.180	0.298 $\pm$ 1.301	0.005 $\pm$ 1.118
Marital Status				
Yes	-0.091 $\pm$ 1.037	0.038 $\pm$ 0.968	0.125 $\pm$ 0.895	0.024 $\pm$ 0.994
No	0.226 $\pm$ 1.000	-0.095 $\pm$ 1.085	-0.313 $\pm$ 1.181	-0.061 $\pm$ 1.029
Migration status				
First	-0.306 $\pm$ 0.848	0.099 $\pm$ 0.946	0.003 $\pm$ 0.916	-0.083 $\pm$ 0.971
Second	0.734 $\pm$ 0.964	-0.236 $\pm$ 1.099	-0.009 $\pm$ 1.193	0.198 $\pm$ 1.056
Year of stay				
<5years	-0.433 $\pm$ 0.775	0.367 $\pm$ 0.866	-0.021 $\pm$ 0.887	-0.096 $\pm$ 0.899
5-10years	-0.204 $\pm$ 1.080	0.483 $\pm$ 1.047	0.214 $\pm$ 0.902	-0.166 $\pm$ 0.915
11-15 years	-0.306 $\pm$ 0.942	-0.014 $\pm$ 1.056	0.121 $\pm$ 0.887	0.168 $\pm$ 1.315
16-20years	0.072 $\pm$ 0.904	-0.538 $\pm$ 0.687	0.065 $\pm$ 0.894	-0.143 $\pm$ 1.006
>21years	0.483 $\pm$ 1.029	-0.235 $\pm$ 1.054	-0.967 $\pm$ 1.202	0.145 $\pm$ 1.000
Employment				
Full time	-0.064 $\pm$ 1.014	-0.021 $\pm$ 0.921	0.054 $\pm$ 0.977	0.022 $\pm$ 1.006
Part time	0.035 $\pm$ 0.932	0.107 $\pm$ 1.068	-0.171 $\pm$ 1.085	-0.064 $\pm$ 1.048
Retired	0.368 $\pm$ 1.230	-0.353 $\pm$ 0.810	0.475 $\pm$ 1.151	-0.095 $\pm$ 1.111
Unemployed	0.028 $\pm$ 1.148	-0.080 $\pm$ 1.370	0.049 $\pm$ 0.595	0.188 $\pm$ 0.785
Education				
Diploma or uni	-0.379 $\pm$ 0.811	0.156 $\pm$ 0.829	0.051 $\pm$ 0.912	-0.118 $\pm$ 0.990
Some college or uni	0.486 $\pm$ 1.066	-0.053 $\pm$ 1.191	-0.106 $\pm$ 1.151	0.140 $\pm$ 1.043
High school	1.253 $\pm$ 1.307	0.143 $\pm$ 1.702	0.172 $\pm$ 0.937	0.205 $\pm$ 0.768
Did not finish high school	0.388 $\pm$ 0.624	-0.753 $\pm$ 0.789	-0.003 $\pm$ 1.350	0.312 $\pm$ 1.125
None	0.900 $\pm$ 0.276	-1.140 $\pm$ 0.782	-0.305 $\pm$ 0.845	0.125 $\pm$ 0.923

NB: All values are mean factor loadings unless stated otherwise.

After adjusting for covariates, there were significant multivariate effects of several socio-demographic factors on dietary patterns (Table 5.10)

Table 5.10 Multivariate effects of sociodemographic factors on dietary patterns

Factor	Pillai's Trace	F	df	Error df	p-value	η^2
Age group	0.113	1.605	8.000	214.000	0.125	0.057
Country of origin	0.215	3.167	8.000	210.000	0.002	0.108
Marital status	0.065	1.872	4.000	107.000	0.121	0.065
Migration status	0.261	9.262	4.000	105.000	<0.001	0.261
Year of Stay	0.276	1.945	16.000	420.000	0.016	0.069
Employment	0.050	0.457	12.000	321.000	0.938	0.17
Education	0.327	2.335	16.000	420.000	0.003	0.082
Income	0.086	1.197	8.000	214.00	0.302	0.043

Using Pillai's trace, country of origin had a significant main effect on the combined dietary patterns, $V = 0.215$, $F(8, 210) = 3.167$, $p = 0.002$. The MANCOVA was followed by a discriminant function analysis, which revealed two discriminant functions. The first function explained 95.2% of the variance, with a canonical correlation of $R^2 = 0.463$. The second function explained only 4.8% of the variance, with a canonical correlation of $R^2 = 0.116$. In combination, these discriminant functions significantly differentiated the dietary patterns, $\Lambda = 0.775$, $X^2(8) = 27.442$, $p < .001$. However, removing the first function revealed that the second function alone did not significantly differentiate the groups, $\Lambda = 0.986$, $X^2(3) = 1.464$, $p = .691$. Therefore, the group differences shown by the MANCOVA can be explained in terms of two underlying dimensions in combination. The correlations between dietary patterns and the discriminant functions revealed that the Western dietary pattern, loaded highly within the first function ($r = 0.906$) and less strongly with the second function ($r = 0.388$). The traditional dietary pattern, loaded more highly with the second function ($r = 0.918$) than the first function. The plant-based and sugar dietary pattern loaded fairly evenly onto both functions ($r = 0.215$ for the first function and $r = -0.218$ for the second function). The discriminant function plot (Figure 5.4) revealed limited differentiation between the groups based on country of origin. Function 1 provided

marginal separation between Nigeria and Cameroon, while Function 2 contributed little to distinguishing Ghana from the other two groups. The centroids were closely clustered, and there was substantial overlap in individual points across all groups. This indicates that the discriminant functions did not effectively differentiate between countries of origin, suggesting that the impact of country of origin on dietary patterns is not clearly distinguishable in this analysis.

Table 5.11 Eigenvalues and explained variance for discriminant functions for country of origin

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.273 ^a	95.2	95.2	.463
2	.014 ^a	4.8	100.0	.116

Table 5.12 Wilk's Lambda test of discriminant functions for country of origin

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 2	.775	27.442	8	<.001
2	.986	1.464	3	.691

Table 5.13 Standardised Canonical Discriminant Function Coefficients for country of origin

	Function	
	1	2
Western DP	.940	.321
African style DP	-.334	.902
Plant-based and Sugar DP	.270	-.218
Meat-centric DP	.006	.004

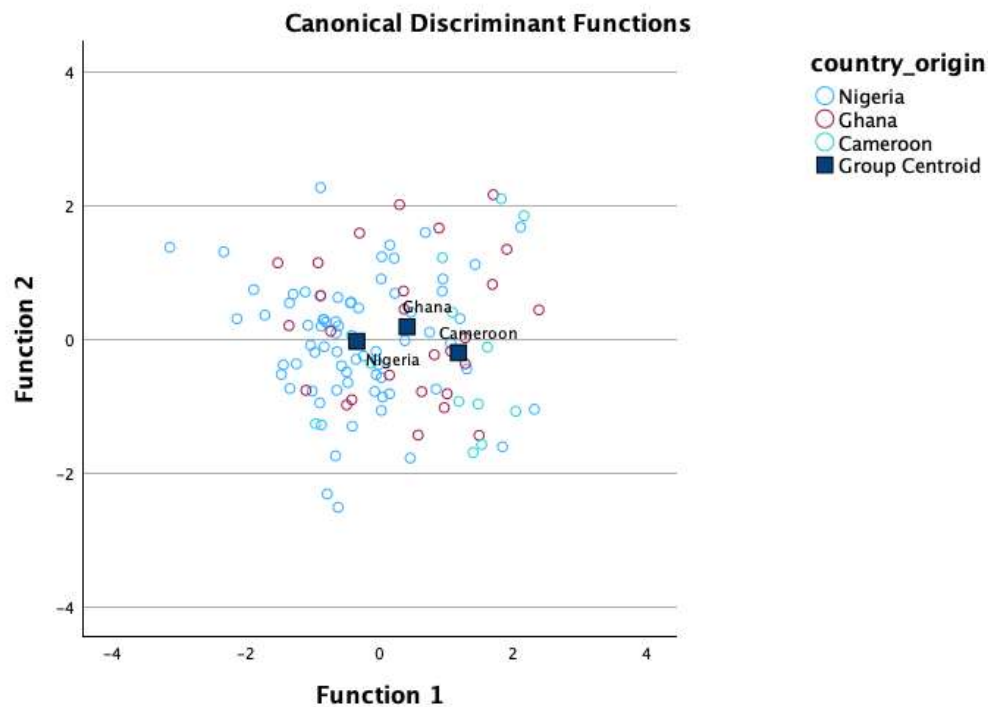
Table 5.14 Structure matrix indicating correlation of dietary patterns and country of origin

	Function	
	1	2
Western DP	.906	.388
African style DP	-.270	.918
Plant-based and sugar DP	.215	-.218
Meat-centric DP	.005	.004

Table 5.15 Group Centroids for country of origin

country of origin	Function	
	1	2
Nigeria	-.345	-.034
Ghana	.409	.183
Cameroon	1.177	-.204

Figure 5.4: Canonical Discriminant Functions Plot Illustrating the Separation for country of origin



Using Pillai's trace, there was a significant main effect of migration status on the combined dietary patterns, $V=0.261$, $F(4,105)=9.262$, $p<0.001$. The MANCOVA was followed by a discriminant function analysis, which revealed one discriminant function that explained 100% of the variance, with a canonical correlation of $R^2 = 0.517$. This discriminant function significantly differentiated the dietary patterns based on migration status. $\Lambda = 0.733$, $X^2(4) = 33.529$, $p < 0.001$. The correlations between the dietary patterns and the discriminant function revealed the Western dietary pattern loaded most highly onto the first function ($r = 0.898$). The traditional

dietary pattern had a negative loading ($r = -0.257$). The plant-based and sugar dietary pattern had a minimal negative loading ($r = -0.014$) while the Meat-centric dietary pattern had a weak loading (0.215).

Figure 5.5: Plot showing the distribution of Western dietary pattern across different country of origin

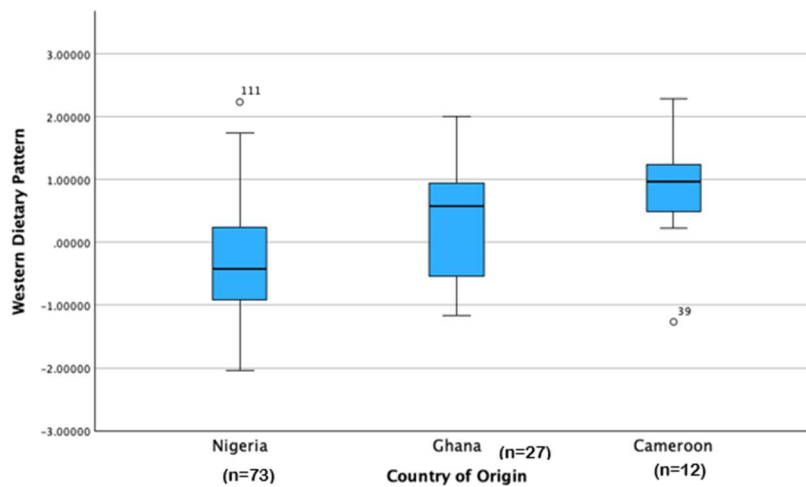


Table 5.16 Eigenvalues and explained variance for discriminant functions for migration status

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.364	100.0	100.0	.517

Table 5.17 Wilk's Lambda test of discriminant functions for migration status

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.733	33.529	4	<.001

Table 5.18 Standardized Canonical Discriminant Function Coefficients for Migration Status

	Function
	1
Western DP	.947
African style DP	-.342
Plant-based and Sugar DP	-.014
Meat-centric DP	.288

Table 5.19 Structure matrix indicating correlation of dietary patterns and migration status

	Function
	1
Western DP	.898
African style DP	-.257
Plant-based and Sugar DP	-.010
Meat-centric DP	.215

Table 5.20 Group Centroids for migration status

Functions at Group Centroids	
Migration	Function
	1
First generation	-.386
Second generation	.925

Using Pillai's trace, there was a significant main effect of length of stay on the combined dietary patterns, $\Lambda = 0.276$, $X^2(16) = 1.945$, $p = 0.016$. The MANCOVA was followed by a discriminant function analysis, which revealed four discriminant functions. The first function explained 86.1% of the variance, with a canonical correlation of $R^2 = 0.508$. The second function explained 9.9% of the variance, with a canonical correlation of $R^2 = 0.196$. The third function accounted for 2.6% of the variance ($R^2 = 0.101$), and the fourth function explained 1.4% of the variance ($R^2 = 0.075$). In combination, these discriminant functions significantly differentiated dietary patterns, $\Lambda = 0.702$, $X^2(16) = 37.631$, $p = 0.002$. However, after removing the first function, the remaining functions (2 through 4) did not significantly differentiate dietary patterns, $\Lambda = 0.946$,

$X^2(9) = 5.884$, $p = 0.751$. Similarly, the third and fourth functions alone did not provide significant dietary pattern differentiation, $\Lambda = 0.984$, $X^2(4) = 1.697$, $p = 0.791$, and $\Lambda = 0.994$, $X^2(1) = 0.605$, $p = 0.437$, respectively. Therefore, the group differences shown by the MANCOVA can be primarily attributed to the first discriminant function. The correlations between the factor scores and the discriminant functions revealed that Western dietary pattern loaded most strongly on the first function ($r = 0.699$), and also moderately on the second function ($r = 0.592$). The traditional dietary pattern loaded highly on the second function ($r = 0.791$) and negatively on the first function ($r = -0.588$). The plant-based and sugary dietary pattern loaded most strongly onto the fourth function ($r = 0.895$) while the meat-centric pattern loaded strongly onto the third function ($r = -0.832$). The discriminant function plot (Figure 5.8) revealed limited differentiation between the groups based on years of stay. Function 1 provided marginal separation, with individuals >21 years showing slight distinction from the other groups, while Function 2 contributed little to differentiating years of stay. The centroids were closely clustered, with substantial overlap in individual points across all groups, indicating that the discriminant functions did not effectively distinguish between the year of stay categories.

Figure 5.6: Plot showing the distribution of Western dietary pattern across different lengths of Stay

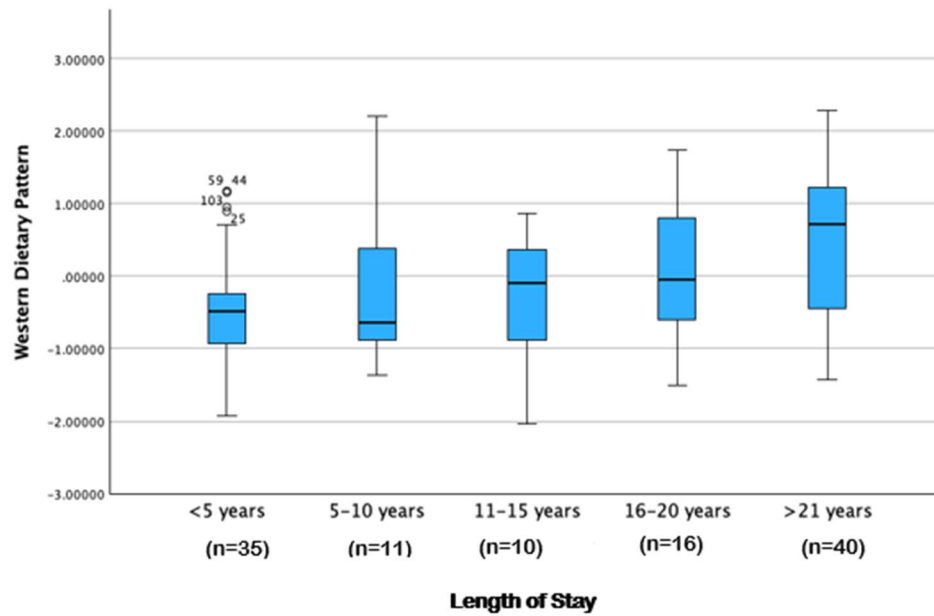


Figure 5.7: Plot showing the distribution of African dietary pattern across different lengths of Stay

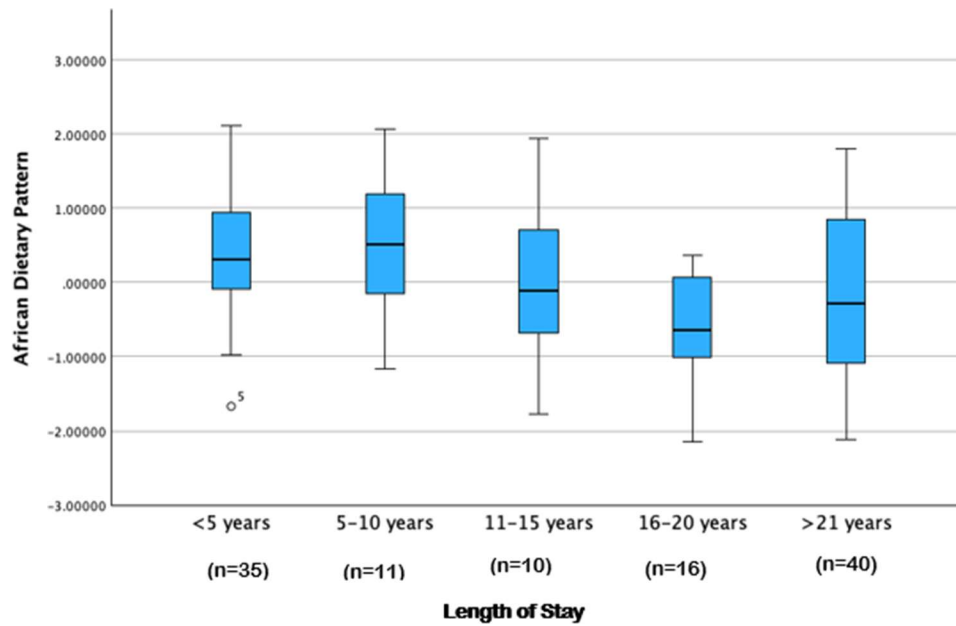


Table 5.21 Eigenvalues and explained variance for discriminant functions for length of stay

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.347	86.1	86.1	.508
2	.040	9.9	96.0	.196
3	.010	2.6	98.6	.101
4	.006	1.4	100.0	.075

Table 5.22 Wilk's Lambda test of discriminant functions for length of stay

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.702	37.631	16	.002
2 through 4	.946	5.884	9	.751
3 through 4	.984	1.697	4	.791
4	.994	.605	1	.437

Table 5.23 Standardized Canonical Discriminant Function Coefficients for length of stay

	Function			
	1	2	3	4
Western DP	.795	.519	.340	.037
Traditional DP	-.692	.719	.143	.030
Plant-based and Sugar DP	-.111	-.201	.393	.891
Meat-centric DP	.194	.294	-.825	.444

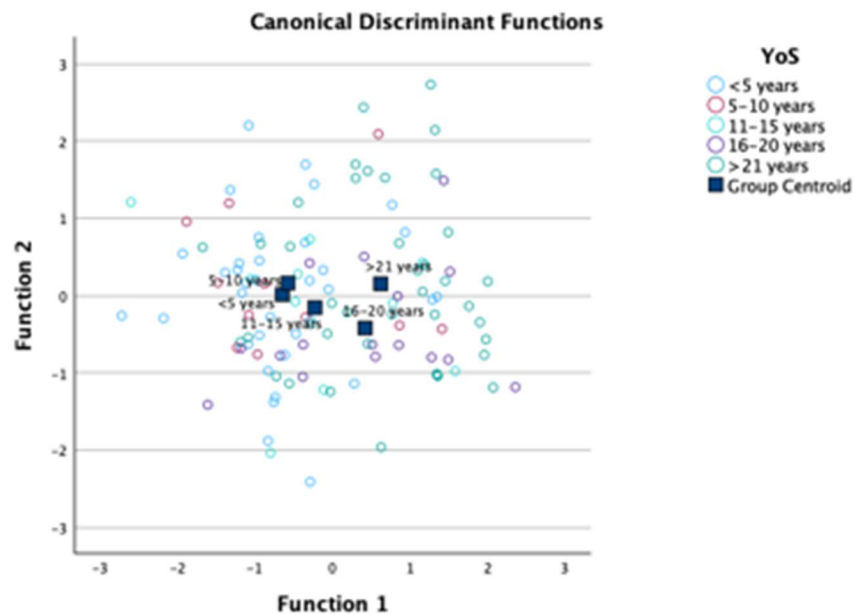
Table 5.24 Structure matrix indicating correlation of dietary patterns and length of stay

	Function			
	1	2	3	4
Western DP	.699	.592	.399	.044
Traditional DP	-.588	.791	.163	.034
Plant-based and Sugar DP	-.083	-.195	.393	.895
Meat-centric DP	.146	.288	-.832	.450

Table 5.25 Group Centroids for length of stay

Year of Stay	Function			
	1	2	3	4
<5 years	-.651	.013	-.032	-.067
5-10 years	-.579	.161	.217	.122
11-15 years	-.230	-.156	-.204	.168
16-20 years	.418	-.421	.088	-.020
>21 years	.619	.152	-.016	-.009

Figure 5.8: Canonical Discriminant Functions Plot Illustrating the Separation for length of stay



Wilks' Lambda indicated a significant main effect of education level on the combined dietary patterns, $\Lambda = 0.656$, $X^2(16) = 44.953$, $p < .001$. A discriminant function analysis was performed, showing four discriminant functions. The first function accounted for 87.1% of the variance, showing a canonical correlation of $R^2 = 0.549$. The second function accounted for 11.5% of the variance, showing a canonical correlation of $R^2 = 0.232$. The third function represented 1.0% of the variance ($R^2 = 0.069$), whereas the fourth function described 0.5% of the variance ($R^2 = 0.049$). In combination, these discriminant functions did not significantly differentiate dietary patterns after the first function, $\Lambda = 0.939$, $X^2(9) = 6.671$, $p = 0.671$. Similarly, the third and fourth functions together did not significantly differentiate dietary patterns, $\Lambda = 0.993$, $X^2(4) = 0.764$, $p = 0.943$, and the fourth function alone was not significant, $\Lambda = 0.998$, $X^2(1) = 0.256$, $p = 0.613$. Therefore, any group differences observed can be largely attributed to the first discriminant function.

The standardised canonical discriminant function coefficients indicated that the Western dietary pattern showed the highest loading on the first function (0.910) and a moderate loading on the second function (0.390). The Traditional African dietary pattern showed loading primarily on the second function (0.876), whereas the plant-based sugar dietary pattern demonstrated the highest loading on the third function (0.928). The meat-centric dietary pattern showed the strongest correlation with the fourth function (0.886).

The structural matrix showed that the Western dietary pattern exhibited the highest connection with the first function ($r = 0.836$), whereas the Traditional African dietary pattern showed a strong association with the second function ($r = 0.913$). The Plant-based and sugar dietary pattern was most correlated with the third function ($r = 0.931$), and the Meat-centric dietary pattern loaded most heavily onto the fourth function ($r = 0.904$).

The discriminant function plot (Figure 5.10) revealed some differentiation between the education groups, particularly along Function 1. Individuals with High school and no education levels showed more separation from the other groups—those with Diploma or university degrees and some college or university, which were more closely clustered. While there was still some overlap between certain groups, particularly those with higher educational attainment, Function 1 provided noticeable distinction between lower and higher education categories. However, Function 2 contributed minimally to differentiating the groups, as evidenced by the clustering along that axis.

Figure 5.9: Plot showing the distribution of Western dietary pattern across different levels of Education

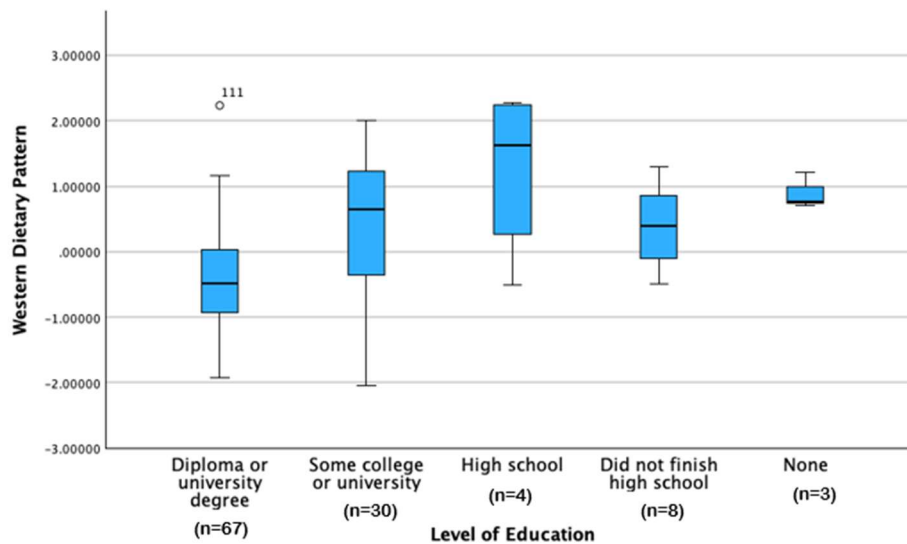


Table 5.26 Eigenvalues and explained variance for discriminant functions for level of education

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.433	87.1	87.1	.549
2	.057	11.5	98.6	.232
3	.005	1.0	99.5	.069
4	.002	.5	100.0	.049

Table 5.27 Wilk's Lambda test of discriminant functions for level of education

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	.656	44.953	16	<.001
2 through 4	.939	6.671	9	.671
3 through 4	.993	.764	4	.943
4	.998	.256	1	.613

Table 5.28 Standardized Canonical Discriminant Function Coefficients for level of education

	Function			
	1	2	3	4
Western DP	.910	.390	-.024	-.194
African style DP	-.459	.876	-.066	.173
Plant-based and Sugar DP	-.125	.096	.928	-.341
Meat-centric DP	.305	-.038	.359	.886

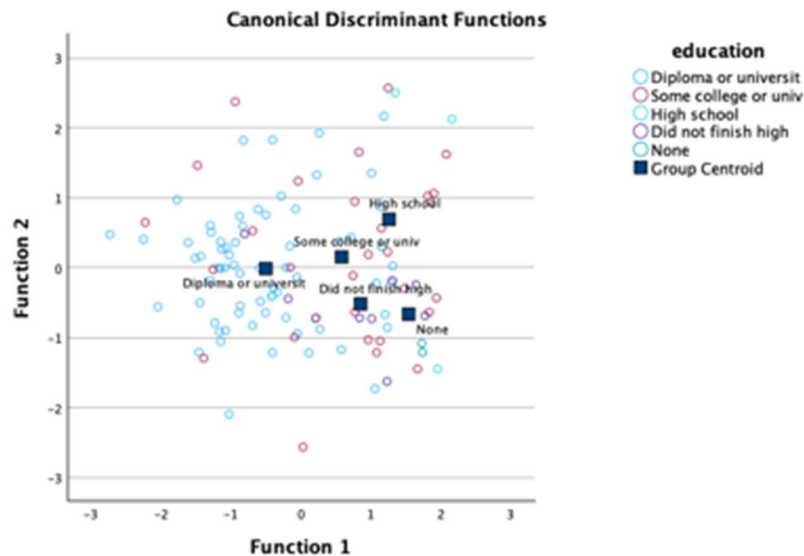
Table 5.29 Structure matrix indicating correlation of dietary patterns and level of education

	Function			
	1	2	3	4
Western DP	.836	.486	-.031	-.254
Traditional DP	-.353	.913	-.072	.190
Plant-based and Sugar DP	-.088	.092	.931	-.343
Meat-centric DP	.218	-.037	.365	.904

Table 5.30 Group Centroids for level of education

Education	Function			
	1	2	3	4
Diploma or university degree	-.504	-.016	.004	-.010
Some college or university	.579	.150	-.056	.043
High school	1.257	.689	.187	-.125
Did not finish high school	.849	-.521	.149	.057
None	1.538	-.667	-.181	-.187

Figure 5.10 Canonical Discriminant Functions Plot Illustrating the Separation for level of education



There was no significant main effect of age group on the combined dietary patterns, $V = 0.113$, $F(8, 214) = 1.605$, $p = 0.125$. Marital status also did not show a significant effect, $V = 0.065$, $F(4, 107) = 1.872$, $p = 0.121$. Additionally, employment status, $V = 0.050$, $F(12, 321) = 0.457$, $p = 0.938$, and income, $V = 0.086$, $F(8, 214) = 1.197$, $p = 0.302$, did not significantly influence dietary patterns (Table 5.10).

5.8 Discussion

This present study aimed to determine the dietary intake and classify the dietary patterns of Black African women in the UK, and their socio-demographic factors. This study represents the first comprehensive examination of the dietary patterns of Black African women in the UK, offering a significant contribution to understanding of how acculturation, socio-demographic factors, and cultural retention influence food behaviours within this group. Additionally, in light of the limited data available on this demographic, the findings from the present study offer new perspectives on dietary intake and broader socio-cultural integration. These results hold

important implications for future research, public health strategies, and the development of culturally relevant interventions.

Dietary intake analysis of Black African women in the UK showed both positive and concerning trends in nutritional habits. The relatively high consumption of fruits vegetables and whole grains aligns with public health dietary guidelines, though it falls just short of the WHO recommendation of 400 grams per day (Angelino et al., 2019; Boeing et al., 2012). This indicates partial adherence to healthy dietary guidelines, potentially reflecting an increase in nutritional awareness among this demographic. The daily consumption of red meat at 150 grammes, and sweets at 263 grammes, was above the recommended limits of 70 grammes and 30 grammes per day, respectively (NHS, 2024). The excess is concerning due to the significant correlation between high intake of these dietary components and an increased risk of chronic diseases, including cardiovascular disease, diabetes, and multiple cancer types (Pan et al., 2022; Shi et al., 2023).

Comparative studies offer mixed results. While there is limited data particularly addressing the dietary intakes of Black African women in the UK, some parallels can be drawn from studies on other Black populations. High consumption levels of processed foods, sugars, and red meat have been found among African Americans in US (World Cancer Research Fund, 2018). This dietary profile closely mirrors the results of the present study, despite the geographical and possible cultural differences between African Americans and Black African immigrants in the UK. Furthermore, the dietary patterns observed in the present study surpass the consumption levels seen in West-African immigrants in Madrid, where the intake of fruits and vegetables was notably lower at 254 grams per day (Delisle et al., 2009). This may suggest that Black African women in the UK may be navigating a complex interplay of traditional food practices and

Western dietary norms, influenced by both cultural retention and adaptation to the UK's food environment.

Additional research supports the findings of the present study. Studies by Leung and Stanner (2011) indicated that Black African and South Asian groups in the UK tend to consume more meat than their White British counterparts. So too, Goff and colleagues showed higher sodium intake among Black African populations in the UK, underscoring dietary habits that may predispose these groups to hypertension and related chronic diseases. These findings highlight important public health concerns, particularly as dietary habits are one of the most modifiable risk factors for chronic diseases, many of which disproportionately affect Black and minority ethnic groups (Public Health England, 2017).

Sociodemographic factors influenced dietary intake. Migration status, length of stay in the UK, and educational attainment were sociodemographic factors that shaped the dietary behaviours of Black African women. First-generation migrants typically adhered more closely to traditional African diets, consuming more whole grains, legumes, and fish. However, dietary patterns shifted towards increased intake of energy-dense foods, processed meats, and sugars with prolonged residence in the UK. This shift aligns with the process of acculturation (Delavari et al., 2013; Ngongalah et al., 2018). Prolonged exposure to the UK's food environment, which is rich in processed and convenience foods, appears to foster an adoption of more unhealthy dietary practices, similar to trends observed in other immigrant populations globally (Satia, 2009; Popkin, 2006). Acculturation theory posits that dietary patterns among immigrants evolve over time due to the gradual assimilation into the dominant culture's food environment (Abraído-Lanza et al., 2006). First-generation migrants often retain traditional eating habits, which may be protective against chronic disease (Okafor et al., 2014). In contrast, second-generation migrants

and individuals with prolonged residence in the UK tended to have dietary patterns reflective of Western consumption, marked by increased intakes of processed and energy-dense foods (Popkin, 2006). This dietary transition has been extensively recorded in migration research and is of considerable concern due to the well-established correlation between Western diets and increased chronic disease incidence (Popkin, 2006).

This study's findings on dietary intake differences by educational level are consistent with broader research on the socioeconomic determinants of health (Giskes et al., 2010; Marmot & Wilkinson, 2005). In the present study women with lower educational attainment reported a higher intake of energy-dense foods, such as processed carbohydrates and sweets. This may suggest limited access to nutritional information or an inability to adopt healthier food choices due to financial constraints. Giskes et al. (2010) reported education as a strong predictor of diet quality. People with higher educational levels would usually have greater access to information on healthy eating and are also more likely to afford healthier food options. Conversely, the present study found that education did not significantly influence protein and fat intake, suggesting that other factors, such as cultural preferences and food availability, may play a role and future research should explore these factors and how they interact with each other.

The identification of four distinct dietary patterns—Western, African style, Plant-Based and Sugar, and Meat-Centric—provides a comprehensive framework for understanding the dietary habits of Black African women in the UK. These patterns reflect a complex interaction between cultural retention, socio-economic status, and the food environment. The Western dietary pattern, marked by high intakes of processed meats, sweets, and sugary drinks, was more prevalent among second-generation migrants and those who had resided in the UK for longer periods, similar to the findings on dietary intake. This shift towards more calorie-dense, processed foods

is indicative of the broader process of dietary acculturation. Studies such as those by Popkin (2006) further substantiates how immigrants become more integrated into Western society, they tend to adopt the unhealthy eating patterns prevalent in the host country, a trend exacerbated by the convenience and affordability of processed foods. These dietary shifts have serious health implications, given that Western diet is strongly associated with obesity, diabetes, and cardiovascular disease (Mirmiran et al., 2017; Satia, 2009). The African dietary pattern, shown by a higher intake of whole grains, legumes, and fish, was more prevalent among first-generation migrants. This pattern mirrors the traditional diets prevalent across many African nations. These diets are characterised by reduced consumption of processed foods and increased consumption of fibre and micronutrient-rich legumes and have been associated with reduced chronic diseases incidence (Sofi et al., 2010). Nonetheless, the gradual erosion of these dietary habits observed in second-generation migrants and long-term residents indicate the vulnerability of traditional food practices to acculturation influences, similar to other immigrant populations (Satia, 2010).

To fully grasp the implications of these dietary shifts, it is also essential to look through the lens of health behaviour theories. The Social Ecological Model provides a useful framework for understanding the various and interconnected levels of influence—individual, interpersonal, community, organisational, and policy—that shape dietary behaviours among different sociodemographic groups.

At the individual level, individual beliefs, knowledge, and perceptions of health profoundly affect dietary choices. Among first-generation migrants, there is often an adherence to traditional diets rooted in beliefs about the health benefits of cultural foods, serving as a connection to cultural identity (Henry et al., 2021). Conversely, second-generation migrants, influenced by Western standards, may perceive lesser barriers to consumption of processed foods (Darmon &

Drewnowski, 2008). Moreover, at the individual level, many Black African women showed a commitment to healthy eating, evidenced by their high intake of fruits and vegetables. This behaviour indicates an awareness of the advantages of healthy diets and a desire to prioritize health (Caso & Vecchio, 2022). The persistent consumption of sugary foods may reflect cognitive dissonance, when the intention to maintain a healthy diet is at conflict with certain eating behaviours. This dissonance may result from individual taste preferences or misunderstandings regarding the health effects of particular foods. Future interventions should address this dissonance by providing clear information regarding the detrimental health impacts of excessive sugar and fat intake, advocating consistent health-promoting choices while regarding cultural norms (Renzaho & Burns, 2006).

At the interpersonal level, social relationships—such as familial, peer, and community networks—profoundly influence food behaviour. For Black African women in the UK, family and cultural traditions may encourage consumption of traditional foods, especially among first-generation migrants. Nonetheless, second-generation migrants or long-term residents, influenced by social networks formed by Western dietary habits, may readily adopt processed foods (Sanou et al., 2014). These findings emphasise the significance of health interventions that leverage these social dynamics, encouraging supportive family and peer networks to reinforce healthier eating within these communities (Meleis, 2010).

At both the community and organisational levels, environmental factors—such as food accessibility, marketing strategies, and institutional support—play crucial roles. The widespread advertisement of processed foods in certain neighbourhoods fosters unhealthy dietary patterns, among younger migrants or long-term residents (Popkin, 2006). This underscores the necessity for community-oriented interventions to enhance the accessibility of healthier food options and

provide resources that also corresponds with cultural requirements, so creating structural support for healthier choices (Dura0 et al., 2020).

At the policy level, broader regulatory measures shape the structural landscape of dietary behaviour. Policies that regulate the marketing and availability of high-sugar and high-fat foods, particularly in areas with high migrant populations, may mitigate pressures that drive unhealthy dietary shifts (Walls et al., 2011). Additionally, policies designed to make healthier foods more affordable and accessible through subsidies or pricing incentives could enhance equitable access to nutritious foods, supporting long-term, sustainable dietary choices for all demographic groups (Huangfu et al., 2024).

The findings of this study, in line with established literature, demonstrate that dietary patterns among Black African women are shaped by a complex interplay of factors across multiple levels. Interpreting these results through the SEM (Caperon et al., 2022; Langille & Rodgers, 2010) highlights how individual behaviours are influenced by broader social, cultural, and environmental contexts. This convergence between the current findings and prior research reinforces the importance of designing interventions that extend beyond individual-level strategies. A comprehensive, multi-level approach—addressing personal beliefs, social influences, community resources, and policy environments—is essential for supporting Black African women in achieving and maintaining healthy dietary behaviours (Caso & Vecchio, 2022).

While the study did not directly assess the effectiveness of public health initiatives, the findings suggest that culturally responsive approaches may be necessary to address the diverse needs within the Black African population. For example, observed differences by education level and

migrant generation point to the importance of tailoring nutrition education and support strategies to account for varying levels of awareness and cultural context. Programs aimed at less-educated women, in particular, could help bridge knowledge gaps regarding the health risks associated with high consumption of red meat and sugar, potentially fostering healthier dietary behaviours.

Nevertheless, education by itself may be inadequate. Structural barriers, like food affordability and accessibility, must be addressed to enable women to adopt healthier dietary choices (Giskes et al., 2010). Furthermore, the prevalence of the Meat-Centric dietary pattern among Black women with limited educational attainment indicates that public health initiatives should prioritise decreasing red meat consumption while advocating for the health benefits of plant-based proteins and traditional African foods. This aligns with cultural persistence theory (Giuliano & Nunn, 2021), which posits that certain dietary practices may remain stable despite migration and acculturation pressures. However, in the context of public health, this theory suggests that efforts to promote healthier eating should emphasise cultural congruence by encouraging the consumption of traditional foods, rather than promoting Western dietary ideals solely.

This study highlights implications for research. Future research should adopt a longitudinal approach to assess how dietary habits among Black African women evolve over time, in relation to acculturation, socioeconomic position, and health outcomes. Such research would yield deeper insights into the long-term health effects of dietary acculturation and assist in identifying key intervention opportunities. Furthermore, qualitative research looking into the cultural and social aspects of dietary habits within this demographic would be highly beneficial. These studies could investigate how migratory experiences, identity, and social networks influence dietary preferences, so offering a more nuanced context for developing culturally relevant public health

initiatives. Finally, that broader food environment in the UK, including the accessibility and promotion of both healthy and unhealthy foods, should be further examined in order to better understand its impact on dietary habits within Black African communities. This would facilitate the development of more extensive public health programmes that go beyond individual behaviour modification to addressing systemic factors that shape dietary choices.

5.9 Strengths and Limitations

This study demonstrates methodological strengths while simultaneously acknowledging some limitations. Collectively, these aspects demonstrate the intricacy of undertaking research within the particular context of Black African populations in the UK, particularly in the area of dietary assessment and nutritional epidemiology.

A notable strength of this study is its comprehensive and culturally tailored dietary assessment. The modification of the EPIC FFQ to incorporate traditional African foods ensured accurate representation of the dietary practices of the Black African community in the UK. This study also enhanced the Intake24 database, a widely used digital 24-hour recall system designed for food coverage in the UK. Although Intake24 offers extensive coverage of items typically consumed in the UK, it previously under-represented those integral to Black African diets. By incorporating African foods into Intake24, this study enhanced the database's applicability for dietary composition analysis specific to African populations, thus filling an important gap for future epidemiological research. Previous research has emphasised the importance of culturally adapting dietary tools to improve accuracy in capturing the dietary habits of ethnic minority populations, as standard tools may not fully account for cultural variations in food items and portion sizes (Cade, 2017). By incorporating traditional African foods such as Jollof rice, fufu,

and Egusi soup into the dietary assessment tool, the study aimed to enhance the cultural relevance of the data collection process. Although engagement and reporting accuracy were not directly measured, using culturally familiar foods likely improved participants' comfort and recognition, which may contribute to more accurate dietary reporting. Future research could benefit from incorporating metrics to explicitly evaluate the impact of culturally tailored tools on data quality and participant engagement.

A further strength lies in the dual use of nutritional assessment methods, combining the FFQ with the 24-hour recalls. This multi-method approach has been extensively corroborated in the literature for enhancing the reliability of dietary data (El Kinany et al., 2018; Khaled et al., 2021). The FFQ is beneficial for evaluating habitual dietary intake. The 24-hour recalls, in contrast, captures more immediate and detailed dietary information, providing a more precise estimate of actual consumption on specific days (Thompson & Subar, 2017). By utilising three separate recalls (two weekdays and one weekend day), the study accounts for day-to-day variability in food intake, which improves the robustness of the data (Shim et al., 2014).

The study's recruitment strategy, which employed community gatekeepers, is another notable strength. Involving reputable individuals from the Black African community, including religious leaders and community heads, enhanced trust and improved recruiting. This strategy is substantiated by studies that have emphasised the significance of community engagement in enhancing participation rates among minority communities (George et al., 2014; Paskett et al., 2008). The involvement of these gatekeepers was particularly crucial in reaching Black African women, where cultural dynamics often influence participation. This community-based approach improved external validity by ensuring that the sample more accurately reflects the population under study.

The present study is further enhanced by its robust statistical design. PCA facilitated the identification of distinct dietary patterns, a method corroborated by several epidemiological studies that underscore its effectiveness in summarising complex dietary data (Newby & Tucker, 2004). This statistical method is especially useful for examining the correlations between diet and health consequences, since it allows for the reduction of large datasets into meaningful patterns, hence enhancing the interpretation of the overall trends in food intake.

Notwithstanding these strengths, the study has limitations that should be acknowledged. A notable limitation is the cross-sectional design, which only offers a snapshot of dietary intake at a single point in time. Cross-sectional studies are beneficial for identifying associations but are incapable of establishing causality (Levin, 2006). This limitation hinders the evaluation of how changes in dietary patterns over time may affect health outcomes. Furthermore, despite the modification of the EPIC FFQ to incorporate traditional African foods, there persists the potential for measurement bias. Black Africans in the UK are not a homogeneous group, as they originate from diverse countries with distinct food traditions. The inclusion of commonly consumed foods may not fully capture the dietary variation across different African subgroups, resulting in potential under-representation of certain dietary habits (Satia-Abouta, 2003). This limitation affects the generalisability of the findings, as the study may not fully represent the broader diversity within the Black African population. Moreover, the utilisation of self-reported dietary data carries the potential of misreporting, often affected by factors such as recall bias and social desirability bias.

The study also relied on self-reported data for anthropometric measurements, including height and weight, which may introduce bias, especially in BMI calculations. Individuals often underreport their weight or over-report their height, generally motivated by social desirability or

personal perceptions, resulting in potential misclassification of BMI categories (Gorber et al., 2007). This may have resulted in the misclassification of BMI categories, thus affecting findings about obesity prevalence and associated dietary factors. Lastly, the sampling method employed, which involved snowball sampling and recruitment through peer networks, also presents challenges in terms of representativeness. Snowball sampling is effective in reaching hidden or hard-to-reach populations such as the present demographic, but it is a form of non-probability sampling, which may introduce selection bias (Sadler et al., 2010). Participants who were more socially connected or health-conscious may have been overrepresented, leading to biased estimates of dietary behaviours. While this strategy was necessary to engage a community that may be wary of traditional research recruitment methods (Ekong et al., 2022), it limits the generalisability of the findings to the broader Black African population in the UK.

5.10 Conclusion

This study offers an in-depth examination of the dietary patterns of Black African women in the UK, emphasising the influence of socio-demographic factors on nutrient intake. It addressed three primary objectives: understanding socio-demographic characteristics, assessing dietary intake, and identifying dietary patterns and their influencing factor. The findings revealed a varied dietary landscape influenced by factors including migration status, length of stay, education, and country of origin. Notably, second-generation migrants exhibited higher intake of energy, carbohydrates, and sugars relative to first-generation migrants. Furthermore, participants residing in the UK for an extended duration exhibited higher consumption of energy and sugar. Education significantly influenced outcomes, as individuals without formal education reported higher energy and carbohydrate intakes; however, these differences diminished after adjustments for covariates.

Four main dietary patterns were identified by Principal Component Analysis: "Western," "African style," "Plant-Based and Sugar," and "Meat-Centric." These patterns demonstrate both the retention of traditional-style diets alongside the adoption of Western eating habits. The Western dietary pattern, characterised by high consumption of sweets, processed meats, and sugary drinks, stands in contrast to the African-style dietary pattern, which comprises whole grains, vegetables, and fish. The Plant-Based and Sugar and Meat-Centric patterns further underscored the diversity of dietary behaviours within the demographic. These patterns were significantly associated with migration status, length of stay, educational level, and country of origin, highlighting the influence of socio-cultural and demographic factors on dietary choices. Nevertheless, certain subtleties emerged, like the relatively small differentiation in dietary patterns influenced by country of origin and length of stay, suggesting a complex interplay between cultural retention and assimilation.

Overall, this study underscores the significance of culturally tailored nutritional interventions to address the diverse dietary patterns found among Black African women in the UK. The blend of traditional and Western dietary elements offers both opportunities and challenges in health outcome management, especially for non-communicable diseases. The findings of this study underscore the necessity of considering socio-economic determinants, including education and migration status, in the development of public health programs designed to improve dietary quality within this demographic. Whilst the study's robust methodology substantiates its conclusions, additional research is required to explore the long-term health implications of these dietary patterns and the influence of acculturation on food choices.

Chapter 6

Thesis study map: Study 4

Study	Objectives
Study 1: Effectiveness of Client-Centred Counselling on Weight Management among Black African Women with Overweight and Obesity in High-Income Countries: A Systematic Review	Objectives: to evaluate the effectiveness of client-centred counselling on weight management in Black African women with overweight and obesity and provide information about: • specific intervention component and skills used • culturally tailored strategies, and theoretical underpinnings
Study 2: Modification and validation of the EPIC FFQ to assess dietary intake in Black African adults	Objectives: • To modify the EPIC FFQ to better reflect the dietary habits, cultural food practices, and food preferences of Black African adults • To validate the modified EPIC FFQ
Study 3: Assessment of Dietary Patterns among Black African Women from sub-Saharan Africa living in the UK	Objectives: • To determine the dietary intake and associated demographic factors • To classify dietary patterns and any associated determinants.
Study 4: A qualitative study exploring factors influencing dietary choices of Black African women with overweight and obesity from Sub-Saharan African living in the UK	Objectives: • With dietary patterns identified from study 3, investigate the factors that influence Black African immigrant women's dietary choices and eating habits.
Study 5: A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women (The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change Wheel	Objectives: • With findings from study 1, 2, 3 and 4, design a nutritional and lifestyle program targeting overweight and obesity among Black African women in the UK

Chapter 6

Study 4: A Qualitative Study Exploring Factors Influencing Dietary Choices of Black African Women with Overweight and Obesity from Sub-Saharan African Living in the UK

6.1 Introduction

The results from study 3 on the dietary patterns of Black African immigrant women residing in the UK demonstrated that prolonged stay in the UK is associated with increased dietary acculturation and increased intakes of energy, total fat, and sodium. This nutritional profile is recognised to directly contribute to the onset of chronic diseases, including cardiovascular disease, diabetes, obesity, and cancer (Keys, 1970; Ravera et al., 2016). The prevalence of these conditions is particularly concerning among ethnic minority populations, notably Black Africans, who disproportionately suffer from many chronic diseases compared to other racial and ethnic groups (Ellis et al., 2020). This present chapter draws on qualitative methodology to explore the factors influencing the degree of continuity and change in dietary practices among Black African immigrant women residing in the UK.

To understand these variations more effectively, it is essential to examine the broader context of factors shaping dietary habits among different groups. In addition to the association between lower income and an increased likelihood for unhealthy eating, several individual and external factors impact dietary habits. Psychological factors, including mood and stress, interact with lifestyle habits such as smoking, increased alcohol use, and time constraints, collectively shaping dietary choices (Best & Papies, 2019; Laraia et al., 2017). Furthermore, local social norms, cultural values, religious beliefs, and the dietary habits of one's peers can substantially influence an individual's personal dietary choices (Okop et al., 2016). In addition, the cost and accessibility of healthy foods adds layers of complexity to the decision-making surrounding food choices (Drewnowski & Spectre, 2004).

Immigrants' exposure to Western lifestyles often induces changes in food habits that are less healthful, hence increasing the likelihood of obesity, cardiovascular illnesses, and diabetes (Misra & Ganda, 2007). The shift towards less healthy dietary behaviours highlights the pivotal influence of dietary and physical activity behaviours on general health and well-being, particularly within immigrant populations, as elaborated in Chapter 2, section 2.3. Individuals show varied responses to a range of influences, including cultural values, social integration, economic conditions, and environmental factors; however, migration often catalyses a process of acculturation, as evidenced by the findings of study 3, in which immigrants adopt the norms of their host country. This phenomenon can result in both beneficial and detrimental changes in dietary habits, further highlighting the need for tailored interventions within immigrant populations. Moreover, migration from low- or middle-income to high-income countries often precipitates shifts in dietary behaviours, resulting in dietary patterns converging with those of the host country's population over time (Kuo, 2014). The shifts in dietary and lifestyle habits, characterised by an increased overreliance on convenience foods and an augmented intake of snacks and sweets alongside more sedentary behaviours, underscore the dynamic nature of dietary acculturation and its implications for immigrant health (Choy et al., 2021; Delavari et al., 2013).

Traditional nutritional counselling methods, such as standardised dietary guidelines or one-size-fits-all programs, often prove ineffective for immigrant populations due to cultural differences and misunderstandings regarding food practices, including differing values assigned to food groups, mutual misunderstandings about food items, and variations in meal organisation or preparation (Satia-Abouta, 2003). Instead, behavioural change interventions targeting populations, including Black African immigrants, should embrace a client-centered approach that

recognises the multifaceted and cultural determinants affecting dietary choices and physical activity habits, as presented in Chapter 3 (Ard et al., 2017; Liu, Wilcox, et al., 2015; Sheppard et al., 2016). Research can bridge the gaps in the understanding of the variations in dietary patterns and explore the barriers and facilitators to adopting healthy eating, thereby facilitating the development of tailored nutritional messages and interventions that empower Black African immigrant women to make informed dietary choices and enhance their overall health and well-being in the UK. This is a crucial step in tackling health inequalities and advancing health equity within this demographic.

6.2 Research Aims and Objectives

The aim of the present study was to gain a more in-depth understanding of dietary choices of Black African immigrant women in the UK identified in study 3, including the barriers and facilitators to adopting healthy diets and lifestyles.

The study sought to address the following objectives:

1. Investigate the factors that influence Black African immigrant women's dietary choices and eating habits.
2. Identify and explore the barriers that Black African immigrant women in the UK encounter when attempting to adopt a healthy diet and lifestyle.
3. Identify and explore the facilitators that contribute to the successful adoption of a healthy diet and lifestyle among Black African immigrant women in the UK.

6.3 Methodology

6.3.1 Theoretical Foundations

Whilst the positivist paradigm utilised in Chapter 5 (Study 4) provided a robust quantitative analysis by determining "what" dietary patterns exist and "how" they occur, its focus on objectivity, measurement, and generalisability (Chun Tie et al., 2019; Mills et al., 2006b) presents inherent limitations in encapsulating the intricate social, cultural, and individual contexts that shape these patterns (Creswell & Poth, 2016; Ryan, 2005). It specifically does not account for the insights into elements that influence dietary choices, including personal beliefs, social networks, and cultural practices, which play a crucial role in shaping individuals' eating behaviours.

To address these limitations, Study 4 employed an interpretivist/constructivist paradigm, utilising qualitative methods to explore the subjective experiences, meanings, and cultural contexts that inform the observed dietary behaviours, thereby offering deeper insights into the underlying reasons for these patterns (Mertens, 2023). This dual research approach ensures a holistic understanding by combining the broader patterns quantitatively identified with the rich, context-specific insights uncovered qualitatively (Creswell & Poth, 2016).

6.3.1.1 Ontology and Epistemology

Selecting an appropriate paradigm is essential, as it shapes both the lens through which the world is understood and the methods employed to interpret and communicate meaning (Chun Tie et al., 2019; Mills et al., 2006b; Ryan, 2005). The credibility and rigour of research findings are greatly improved when there is coherence between the researcher's philosophical assumptions and the study's aims, objectives, and design. Ontology pertains to the nature of reality, epistemology

examines the nature of knowledge and its acquisition, and methodology involves the strategies and tools employed to investigate that reality (Creswell & Poth, 2016).

This study adopts an ontological stance of relativism, asserting that reality is multifaceted, subjective, and contingent upon context and interpretation. This viewpoint is shaped by the researcher's lived experiences with overweight and obesity, together with interactions within the cultural milieu of being a Black African immigrant. The study is informed by the epistemological standpoint that knowledge is constructed within specific contexts, consistent with an interpretivist/constructivist worldview.

6.3.1.2 Interpretivist/Constructivist Paradigm

The interpretivist/constructivist paradigm emerged as a response to the limitations of post-positivism, emphasising a deeper understanding of social phenomena. This paradigm, rooted in a relativist ontology, posits that reality is multiple, subjective, and contingent upon context, influenced by the researcher's experiences and social environment. Drawing on the works of Husserl (2001) on phenomenology and Dilthey (1989) on hermeneutics, it employs a subjectivist epistemology, wherein knowledge is co-constructed and contextually variable (Dilthey, 1989; Eichelberger, 1989; Mertens, 2023). This approach corresponds with the anti-positivist perspective of interpretivism, which highlights collaborative meaning-making with participants and acknowledges the social construction of reality (Denzin & Lincoln, 1996).

In addition, the constructivist paradigm assumes that multiple, co-existing realities are influenced by historical, temporal, cultural, and subjective contexts. Knowledge is viewed as a representation of reality constructed by individual interpretations (Guba & Lincoln, 1994; Lincoln & Guba, 2016). The researcher actively co-creates meaning, engaging with participants influenced by their own experiences. Reflexivity is essential, since it requires the researcher to

recognise how their role, experiences, and subjectivities influences the research process and results, thereby offering vital context to the study.

Advocates of this paradigm favour qualitative methodologies that utilise inductive and abductive reasoning strategies (Whitehead et al., 2016). These methodologies enable an indepth exploration of individual and subjective experiences, while offering a comprehensive account of their contexts. The primary goal is to gain a deep, contextual understanding of the interpretation of individual experiences. Understanding social context is important for meaning construction; hence, researchers must account for the contextual elements of an individual's life while interpreting data.

The interpretivist paradigm often employs research methodologies including ethnography, phenomenology, and thematic analysis (Davies & Fisher, 2018). Thematic analysis is particularly effective in identifying and analysing patterns of meaning within qualitative data, allowing flexibility in capturing the richness and complexity of participants' lived experiences without the constraint of building a new theory.

6.3.2 Research Design

The choice of methodology in research is pivotal, since it shapes data collection, analysis, and ultimately the insights derived. As previous noted, interpretive research offers several methodological approaches that researchers can employ, each suited for different facets of social inquiry (Davies & Fisher, 2018). No specific methodology holds inherent superiority over others (Guba & Lincoln, 1994); instead, the distinction is in the manner each approach addresses problems and offers solutions. This present study employs thematic analysis over of

ethnographic research, grounded theory, and other qualitative methodologies, based on the specific research question and the nature of the phenomena being investigated.

Ethnographic research, a traditional methodological approach, delves into the socio-cultural contexts and meanings within a particular culture or group (Najafi et al., 2016). Although it excels in delivering rich descriptions of cultural phenomena and meanings, its focus on understanding specific cultural aspects, including social setting, does not align with the objectives of this study. The fundamental principles of traditional ethnography require the researcher's unfamiliarity with the cultural setting they are investigating (Richards & Morse, 2012). Additionally, data collection typically involves prolonged periods of observation and may include recording through audio or video means (Knoblauch, 2005). Nevertheless, such extensive data collection methods were impractical within the parameters and scope of this PhD program. Modern ethnographic methodologies, including focused ethnography, have emerged. This newer method requires that researchers have a background or insider knowledge of the cultural group being studied, a requirement that aligns with my own experience as a Black African immigrant. However, while I am familiar with the Black African cultural setting, being a Black African immigrant from sub-Saharan Africa, I am interested in creating meaning as a dynamic process and understanding individual meanings and ideas. The focus of ethnography on understanding shared values of the cultural group being studied limits an understanding of individual values and ideas (Najafi et al., 2016). The factors influencing dietary choices and habits of immigrant Black African women as well as their perceptions of barriers and facilitators to healthy eating in the UK necessitate an exploration of individual meanings and ideas, which ethnography may not fully capture.

Grounded theory, on the other hand, is distinguished by its capacity to generate new theories from empirical data (Holton, 2008). Its inductive nature, characterised by researchers engaging with the topic with limited preconceived notions (Mills et al., 2006b), may correspond with the exploratory nature of this present study. Grounded theory facilitates the collaborative construction of meaning between researchers and participants, promoting a shared understanding of the phenomena being studied. However, although grounded theory excels in theory formation, its focus on the explanation of why things happen and formulating theories is not the principal objective of the present study. Rather, the focus is on understanding how meaning is created through the interpretation of actions and interactions—a dynamic process effectively captured by thematic analysis (Braun & Clarke, 2006).

Consequently, thematic analysis emerged as the most suitable method for the present study. In contrast to ethnography, thematic analysis facilitates the identification and interpretation of patterns or themes within the data, irrespective of cultural context (Braun & Clarke, 2006). Thematic analysis has argued to be a process utilised by many qualitative methods rather than a separate method (Boyatzis, 1998; Holloway & Todres, 2003; Ryan & Bernard, 2000), others argue that it merits recognition as an independent method (Braun & Clarke, 2006). It is essential to conduct the research rigorously and systematically to yield meaningful and beneficial outcomes. This ensures its acceptance as reliable, demonstrating that data analysis has been thorough, consistent, and meticulous. This entails documenting, organising, and transparently presenting the analytical methods with sufficient detail for readers to evaluate their credibility (Nowell et al., 2017). Thematic analysis offers flexibility in identifying, analysing, organising, describing, and reporting themes present within the data (Braun & Clarke, 2006), rendering it appropriate for exploring individual perceptions and meanings. Moreover, thematic analysis

accommodates the fluidity of meaning construction, corresponding with the research question's focus on Black African immigrant women's interpretations of their experiences regarding dietary choices and cultural adaption.

6.3.3 Sampling and Recruitment

The aim of this study was not to test a specific hypothesis, but rather to explore an emerging area and describe a phenomenon that lacks comprehensive understanding. Hence, employing subjective methods to determine suitable participants was imperative (Etikan et al., 2016). To accomplish this, a nonprobability purposive sampling method was utilised to recruit 15 participants which conforms with the recommendation of at least 12 participants to reach data saturation (Braun & Clark, 2013). Purposive sampling with elements of systematic selection was employed. Participants for this study were initially drawn from those who expressed interest in participating after completing the FFQs (Study 2). After the initial screening, a purposive selection procedure was conducted, taking into account factors such as ethnicity, age, and length of stay in the UK. Nonetheless, it is important to acknowledge that the majority of participants who indicated willingness to participate in the study were from a single predominant ethnic group, resulting in a more homogeneous sample. This intentional approach aimed to offer a more balanced perspective on the subject matter and ensure representation across diverse demographic categories, including age groups, length of residency in the UK, and socioeconomic backgrounds. Furthermore, thematic analysis, as the selected methodological and analytical framework, aligns with the exploratory nature of the study, facilitating an in-depth exploration of participants' experiences and perspectives (Braun & Clarke, 2006).

This approach is consistent with other qualitative methods, such as interviews, focus groups, and case studies, which also prioritise the purposeful selection of samples to yield “information-rich” cases that provide valuable insights (Patton, 1990). Purposeful sampling is a technique widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Patton, 1990). This involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest (Creswell & Poth, 2016). In addition to knowledge and experience, Bernard (2017) and Spradley (2016) note the importance of availability and willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner. The inclusion criteria described in Chapter 4, section 4.4.2 were maintained. Women were eligible for inclusion if they were African immigrant women from sub-Saharan Africa living in the UK, 18 years or older, first or second-generation immigrant with a BMI >25kg/m² (Table 4.1).

6.3.4 Data Collection

The choice of research methods must be meticulously aligned with the specific research question being investigated (Charmaz, 2006). Various data collection methods may be suitable depending on the nature and complexity of the research problem. This study employed individual interviews as the primary approach, acknowledging the widespread recognition of interviews as a key tool for qualitative data collection (Green and Thorogood, 2018). Individual online interviews were scheduled with Black African women following the completion of the FFQs. The decision to prioritise in-depth interviews over focus group discussions (FGDs) was informed by the unique challenges associated with recruiting Black African immigrant women, who are frequently

identified in the literature as a "hard-to-reach" population (Ekong et al., 2022; George et al., 2014).

Within the framework of thematic analysis, interviews are particularly effective for capturing rich, detailed narratives that facilitate the identification of recurring themes and patterns. While FGDs are also a common qualitative method, individual interviews were chosen for their capacity to elicit in-depth, distinct insights from participants. Additionally, the logistical complexities of organising FGDs with this group, coupled with the necessity to explore each woman's unique experiences, rendered individual interviews the most appropriate choice (Dickson-Swift et al., 2007). Furthermore, while in-person interviews have traditionally been the standard, the growing use of virtual interviews is notable and was considered in this study (Kite & Phongsavan, 2017).

6.3.4.1 Interview Guide

A carefully designed semi-structured interview guide was developed for conducting the interviews, prioritising open-ended questions (see to Appendix 4). In qualitative research, unstructured interviews are often employed to enable participants to express their perspectives without the constraints of predetermined questions, which closely corresponds with the principles of grounded theory (Foley et al., 2021). Grounded theory generally advocates for unstructured interviews to facilitate the development of theories directly grounded on the evidence (Glaser, 2007). However, this study utilised thematic analysis instead. In light of this methodological approach, semi-structured interviews were deemed the most suitable data collection method. Semi-structured interviews strike a balance between facilitating in-depth participant discourse and allowing the researcher to focus on predetermined areas of interest

(Foley et al., 2021). This approach ensures that, although the conversations are open-ended, the researcher retains adequate control to successfully explore particular research questions and objectives (DeJonckheere & Vaughn, 2019).

The interview schedule functioned as a dynamic framework, guiding the conversations while allowing for the flexible exploration of constructed themes. Semi-structured interviews are particularly well-suited to thematic analysis, as they facilitate the collection of rich, nuanced data that can be systematically examined to identify patterns and recurring themes (Charmaz, 2006). The process of developing the interview guide involved several steps: collaboration with subject matter experts, an extensive review of existing literature, and an examination of methodologies from comparable studies (Osei-Kwasi et al., 2017).

The final interview guide incorporated open-ended questions tailored to the study's aims and designed to explore gaps identified in the literature. To ensure the guide's appropriateness and sensitivity to the participants' contexts, a pilot study was conducted with a sample (n=3) of African immigrant women from a local church in London. Feedback gathered during this pilot phase informed revisions to the format, shortening the overall length of the interview guide, rephrasing certain questions to ensure clarity and effectiveness. These adjustments were crucial in enhancing the guide's relevance, ensuring it was both methodologically sound and culturally responsive. The pilot interviews were not included in the final analysis, as their primary purpose was to refine the interview process rather than to contribute to the main study's findings.

6.3.4.2 Interviews with Black African Immigrant Women Living in the UK

Interviews with eligible and consenting women were done over Zoom, with participants selecting dates and times to accommodate their schedules. The interviews took place from March

to May 2024. The interviews had a mean duration of 51 minutes and 55 seconds (SD=0.01). Every interview was recorded. A conversational interviews style was utilised to mitigate power imbalances and foster trust and rapport (Charmaz, 2014). Facilitating a dialogue with participants until they feel comfortable sharing their stories is deemed crucial for conducting effective interviews (Karnieli-Miller et al., 2009; Mills et al., 2006a). The interviews commenced with informal pleasantries and providing background information of the researcher and the study. This approach facilitated rapport-building and fostered a comfortable environment, transforming the interaction from a formal interview into a more conversational exchange. Consequently, participants experienced more comfort in sharing their experiences, resulting in richer and open discussions.

6.3.5 Ethical Considerations

6.3.5.1 Power Imbalances

Addressing power imbalances in qualitative research is dynamic and ongoing process that extends all phases of the study, including recruitment, ethical considerations, data collection, analysis, and validation (Karnieli-Miller et al., 2009). Different strategies have been suggested to improve reciprocity and equilibrate the power dynamic between researchers and participants. To illustrate, as previously noted, employing a conversational interview style can facilitate a more equitable distribution of power, enabling participants to feel more engaged and less constrained by the formal interview structure (Anyan, 2013; Karnieli-Miller et al., 2009).

Another vital strategy entails maintaining reflexivity during the research process. Reflexivity requires that researchers consistently reflect on their own views, biases, and possible influences on the research (McGhee et al., 2007). In this study, the researcher demonstrates reflexivity by critically examining their philosophical assumptions and reflects on how these beliefs influence

the research design, data collection, and analysis. This continuous reflection aids in interpreting the findings with an awareness of the researcher's potential biases, ultimately enhancing the study's credibility and integrity.

In the recruitment stage, comprehensive participant information sheets were distributed to all potential participants. The materials outlined the study's aims, procedures, risks, and benefits, ensuring participants were fully informed about their involvement. Potential participants were afforded sufficient time to review this information, pose enquiries, and consider their decision prior to granting their informed consent for participation in the interviews. To ensure the appropriate representation of participants' voices, response validation, otherwise known as member checking, was utilised (Birt et al., 2016). Interview transcripts were returned to participants for their review and verification of the recorded information's accuracy. This step not only validated the data but also empowered participants by granting them control over their narratives and interpretations. Notably, no participants expressed any issues or concerns during this review process.

6.3.5.2 Anonymity

To protect participant identity while respecting their autonomy, the researcher instituted various measures during the study. Although total anonymity from the main researcher was unattainable—mainly due to the necessity of collecting identifying information, such as email addresses and phone numbers, for virtual communication—all collected data was managed with utmost confidentiality. The data was securely stored on encrypted computers provided by St Mary's University, ensuring strict access control.

To further enhance the protection of participants' identities, interview transcripts were anonymised by substituting participants' names with a unique numbering system, so eliminating any direct identifiers. Furthermore, transcripts were carefully transcribed to remove any information that would inadvertently disclose participants' identities. This approach was crucial given the relationship established with the Black women in the study; the researcher sought to build trust to enable open dialogue, while implementing all ethical measures to safeguard their confidentiality and privacy. Maintaining this confidence and ensuring anonymity was considered both essential and ethically appropriate throughout the research process.

6.3.5.3 Confidentiality

Potential participants were informed through the PIS about the specific purposes for which their data would be used and the individuals who would have access to it, in accordance with ethical guidelines (Sanjari et al., 2014). Only personal data deemed strictly necessary for the research was collected, in full compliance with the General Data Protection Regulation (GDPR, 2018) and the Data Protection Acts of 2018. All initial contacts were made using the researcher's official university email address, as outlined in the PIS, which also provided detailed information on data storage and protection measures.

Demographic information was collected through online questionnaires (JISC tool) and securely stored on password-protected computers. Interview transcripts were saved on encrypted data drives provided by St Mary's University, with access limited exclusively to the researcher and her supervisors to ensure confidentiality. To maintain participant anonymity, names were replaced with a unique numbering system, and all identifiable information was removed from the data used in the analysis. Following St Mary's University's data management policy, all research

data, including interview recordings, are securely retained for 10 years after the final publication date to ensure compliance with institutional and legal requirements for data retention.

6.3.5.4 Informed and Valid Consent

Obtaining informed consent is a crucial ethical obligation for study participation. It adheres to the principles of autonomy, ensuring that all participants fully comprehend the study's nature and willingly consent to participate (Sanjari et al., 2014). To streamline this process, the PIS, which included a summary of the study, its objectives, safeguarding information, and additional details along with consent forms, was emailed to women who indicated interest in the study after completing the FFQs. Upon receipt of the signed consent forms via email, interview schedules were arranged with the participants. Further clarification was offered whenever the language or content of the information sheets was ambiguous to participants.

In some instances, further explanations were required, not due to the language used in the documents, but rather because of the recruitment process itself. Community gatekeepers, such as members of local churches, suggested that meeting with potential participants in person following their introduction of the study and provision of consent forms, would help build trust. Studies demonstrate that shared identity factors, such as accent and background, can substantially influence participants' levels of comfort and readiness to participate in research (Chavez, 2008). In this context, my accent as an immigrant Black African woman may have fostered a sense of familiarity and comfort, prompting participants to engage more openly in the study. These in-person meetings were held to cultivate trust and enhance recruiting rates; reflections from these encounters are detailed in section 5.8. Subsequent to these meetings, participants were afforded sufficient time to consider their participation and make a well-

informed choice. This waiting period ensured that consent was given willingly and thoughtfully, conforming to ethical standards for voluntary participation.

6.3.5.5 Ethical Approval

Ethical approval was obtained from St Mary's University Research Ethics Committee (SMU_ETHICS_2021-22_368). This approval was obtained prior to the commencement of the study and was necessary to ensure the study adhered to ethical guidelines.

6.3.6 Data Collection and Analysis

All interviews were recorded with the participants' consent and transcribed verbatim to ensure accurate and thorough analysis. This approach enabled a comprehensive analysis of the data (Silverman, 2021) and minimised the risk of misinterpretation or inaccurate recall of the discussions (Flick, 2022).

The primary objective of the data analysis was to identify the factors influencing participants' dietary and physical activity habits and to systematically organise the initially unstructured data into distinct categories and themes created during the analysis (Côté et al., 1995). Please see appendix 9 for examples of the coding process. Reflexive theme analysis was employed to do this, integrating a comprehensive consideration of reflexivity in this context (Braun & Clarke, 2019). In accordance with Braun and Clarke's (2019) approach for thematic analysis, this process involved several essential stages: data familiarisation, initial code generation, theme identification, theme review, theme definition and naming, and final report production. All transcripts were imported into ATLAS.ti v.23.2.1 (Herbst et al., 2024) software program for systematic analysis. Each transcript and its corresponding audio files were reviewed and coded using an iterative process involving multiple readings and the assignment of overarching theme

codes. Each piece of data was coded under at least one main theme, however certain segments were assigned multiple codes depending on the nature of the content discussed. Further information regarding the reflexive process can be found in section 5.8.

As the analysis advanced, these initial codes were refined and merged into more defined categories. For each category, comprehensive summaries were developed, incorporating both descriptive and interpretive elements, through iterative engagement with the data to ensure a deep understanding of the underlying patterns. Deviant cases — those instances that diverged from the general trends in the data — proved to be especially valuable in challenging and refining explanations (Seale, 1999; Silverman, 2021).

The utilisation of a semi-structured interview guide improved the consistency of data among various participants (Flick, 2022), and the themes were systematically compared across all transcripts. Consistently revisiting the original texts was essential for contextualising participants' responses and understanding them within the broader flow of the in-depth interviews. This approach facilitated a more inductive analysis, generating categories, themes, and patterns that are directly rooted in the data.

To improve the credibility and reliability of the findings, all analyses and interpretations underwent discussion and review in collaboration with the supervisory team, ensuring that multiple perspectives were taken into account in the data interpretation. Furthermore, the researcher sought the input of 'critical friends'—peers from the academic community and fellow students—throughout the analysis phase (Appleton, 2011). The contributions of these individuals offered valuable and constructive feedback, challenged assumptions, and provided diverse

perspectives that enhanced the robustness of the research. Further insights into the reflexive practices utilised during the analysis process can be found in Section 5.8

6.4 Results

6.4.1 Characteristics of Participants

A total of 15 Black African women volunteered to participate in these individual interviews. Each participant met the inclusion criteria outlined in Chapter 4, Table 4.1, which details the specific characteristics of the sample. Since all participants were proficient in English, there was no need to provide translations in Pidgin English, as initially stipulated in the study protocol. All participants had a bicultural diet; none completely maintained a traditional diet from their home country nor entirely adopted a British diet (i.e., a diet consisting exclusively of foods not usual in their home country), they were all on the spectrum in between. Similarly, their diets varied on a continuum between healthy (e.g., rich in vegetables, fruit, and whole grains) and unhealthy (e.g., high in processed foods rich in sugar, salt, and/or fat) (Chapter 5, section 5.7.2 and 5.7.3).

The demographic and socio-economic characteristics of the participants were examined to contextualise the research findings. Table 6.1 presents the detailed demographic characteristics of the participants, providing an overview of the study's sample.

Table 6.1 Demographic characteristics of study participants (n=15)

Characteristics	Level	N
Age group (years)	25-44	9
	45-64	4
	65-75	2
Country of origin	Nigeria	12
	Ghana	3
Married or living with common-law partners?	Yes	13
	No	2
Migration status	First generation	14
	Second generation	1
Length of stay in the UK	<5 years	2
	5-10 years	5
	11-15 years	3
	16-20 years	0
	>20 years	5
Employment status	Full time	8
	Part time	4
	Retired	1
	Unemployed	2
Level of education	Diploma or university degree	8
	Some college or university	4
	High school	3
	Did not finish high school	0
Level of income (pounds)	Less than 20,000	5
	20,000- 39,000	6
	More than 40,000	4
BMI classification (kg/m²)	Overweight/pre-obese	4
	Obesity class 1	6
	Obesity class 2	5
	Obesity class 3	0

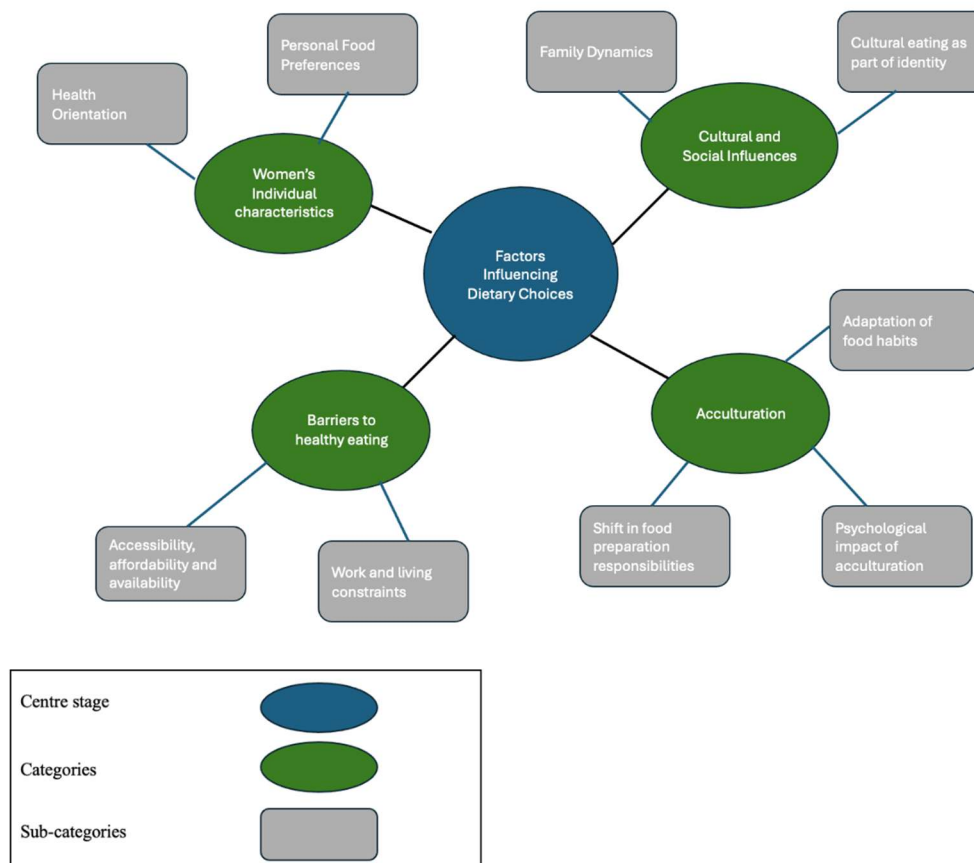
6.4.2 Factors Influencing Dietary Choices and Habits Among Black African Immigrant

Women Living in the UK.

The rich descriptions given by participants revealed the complexity and dynamic nature of the dietary acculturation process after immigration to the UK. Four categories were created from the analysis of data from interviews with the participants: 1) Women's Individual Characteristics, 2)

Cultural and Social Influences, 3) Acculturation and 4) Barriers to healthy eating. The findings are presented in the order to which the categories were constructed from the narration. When participants discussed the factors influencing their dietary choices, their narrations focused on their own individual circumstances and how their own preferences influenced their food choices. The discussion then expanded to culture and the role culture plays in their food choices. The participants went further to discuss their processes of adapting in the new environment that they had come into, which is known as acculturation. Categories and sub-categories are depicted in Figure 6.1.

Figure 6.1: Centre stage diagram showing factors influencing dietary choices, with main categories and sub-categories identified through the data analysis for Black African women recruited to a qualitative study of food choice.



6.4.2.1 Category: *Women's Individual Characteristics*

In examining the factors that shape dietary choices and outcomes among Black African immigrant women, women's individual characteristics was an important category. These influences are deeply embedded in personal experiences, beliefs, and knowledge that drive behaviours related to health and nutrition. Understanding these individual characteristics offers insights into the ways these Black African women navigate their health journeys, particularly regarding their food preferences, nutritional knowledge, and overall health orientation. This

section delves into the sub-category of individual characteristics among women, exploring the influence of personal food choices and knowledge on dietary choices and outcomes. Within this categories, two main sub-categories were created **health orientation and personal food preferences**. These categories reflect the personal dimensions that influence what women choose to eat and how they approach their diet in the context of their health.

6.4.2.1.1 Sub-category: Health Orientation

Every participant demonstrated a foundational knowledge of nutrition and health orientation, which played a crucial role in shaping their dietary choices. They were acutely aware of the health implications of their eating habits and expressed concerns about rapid weight gain and managing existing health conditions. The challenges of weight loss were further complicated by these health considerations, particularly in the context of adapting to a new environment. The women highlighted the significance of nurturing healthy children, which served as a powerful motivator behind their health-conscious choices. This underscores the importance of health values that are intergenerational and the role of maternal influence on family dietary practices.

Participant 9 reflected on her heightened awareness of nutrition and health since relocating, stating: *"I've started paying more attention to what I eat since I moved here, mainly because of health concerns. I know that some of the foods I'm used to might not be the healthiest, especially with the amount of oil and spices we use. My sister has been advising me on food choices, like what healthy meals to eat and all of that. I'm trying to make better decisions now, but it's not easy changing habits that have been with me for so long. I know it's important for my health, so I'm trying to be more conscious about it."*

Other participants recounted similar experiences:

"Honestly, I wouldn't say I have had the healthiest of meals, especially growing up. Back home, the focus was more on making sure you ate enough, not necessarily on how healthy the food was. Now that I'm older and more aware, I've started thinking about how the food I eat impacts my health. My family has been a big help with this; they are always advising me on how to eat healthier. I try to balance things now, especially since I know that some of the traditional foods I love might not be the best for my health in the long run." P4

"But obviously, if food is delicious, you want to eat more. Or if you decided that last year, I'm not gonna do this anymore. I want to remain this. Anything can be done if you're disciplined. So that discipline I put it in myself." P12

Women also reported experiencing rapid weight gain after relocating, attributing it to changes in lifestyle and diet. One participant explained, *"...I have noticed changes in my weight since I moved here [UK]. The lifestyle is different, and I think the food plays a big part in that. I'm not as active as I used to be, and I think the food here, combined with the less active lifestyle, has caused me to gain weight quicker than I expected. It's something I'm concerned about, and I know I need to address it before it becomes a bigger issue." P6*

The challenge of weight loss was a recurring theme, with several women expressing frustration over the difficulty of losing weight in their new environment. One participant described her struggles: *"I've been struggling with my weight since I moved here [UK]. Back home [Nigeria], I didn't really have to worry about it as much, but now, it's a real challenge. I've been sharing my weight issues with my family, and they've been advising me on how to lose weight, but it's not easy. I've tried to change my diet, to eat healthier and exercise more, but the results are slow.*

It's frustrating because I know I need to lose weight for my health, but it's a constant struggle to find the right balance." P4

Another participant also expressed her frustration, "And for the first time in maybe two years since I've been here. Almost a few months ago, I just checked my weight. And I screamed at my weight. I did not know how I got to such weight over such a short period of time. So that again brought about the need to eat right." P11

"looking at myself when I was in Nigeria versus here, first of all, I have added, so much weight, I think I used to weigh about 70kg, which was not even healthy, just imagine weighing 70g in Nigeria, right, and that was abit a of a struggle for me, and I kept on, I want to improve my diet, I want to live a healthy lifestyle, and all of that, and this is barely just one year, I came to the UK, I'm already 90 kg, just that means, that's over 30, 20 kg, you see..." P9

6.4.2.1.2 Sub-category: Personal Food Preferences

Dietary choices among the women were deeply influenced by their personal food preferences, which are intricately linked to their cultural identity. A prominent theme was the strong preference for well-seasoned and flavorful foods, reflecting a cultural tradition that emphasises rich, spicy meals. This preference was consistently highlighted as another important factor shaping their dietary habits, particularly in contrast to the local British cuisine.

Participant 9 vividly articulated this sentiment, "Where I come from, we like really spicy meals, and meals that have a lot of salt and peppers. You know, when we cook, we like to add lots of flavors, different kinds of spices that make the food really rich and tasty. For me, what I have tasted of British food so far, they are a bit bland. They are nice, but a bit bland, too bland for my liking. I've had to add my own seasoning to make it taste like what I'm used to. I remember when

I tried bangers and mash for the first time; it wasn't bad at all, really nice actually, but I had to just add my salt and peppers to get that flavour I'm used to, and yeah, then I was good to go."

In addition to the challenge of finding satisfaction with local British cuisine, the women also expressed difficulties in adapting to the use of local vegetables. The transition to British vegetables not only affected their taste preferences but also led to a perceived decrease in satisfaction and fullness. This underscores the importance of taste and flavour in the acceptance and enjoyment of new foods within a different cultural context. As one participant explained, *"...so for instance the broccoli, I'm not a massive fan of the broccoli, I'm not a massive fan of it, I eat it because of the health benefits, but I find that... I feel like it's really difficult to swallow...probably if I was in Nigeria, I could make vegetables soup, with fluted pumpkin, or pumpkin leaves, water leaves, put probably like Periwinkles, that would serve as my vegetable, and it would be really fresh, but I can't have that here, you know, so I have to make do with broccoli, and oh my gosh, I can just about tolerate it for once in two weeks, you know, because I find it really difficult to swallow, even the Brussels sprouts, it's really difficult for me to swallow..." P4*

Participant 7 shared a similar experience, noting, *"I haven't really done much with local vegetables, it's not something I've adapted to completely. Back home [Nigeria], we have our specific vegetables that we use, and I know how to prepare those in ways that make them taste really good. Here, I've noticed the vegetables are different, and I'm not always sure how to cook them the way I like, so I tend to stick to what I know, or sometimes I just avoid them altogether. It's been a bit of a challenge trying to incorporate them into my meals."*

Moreover, the feeling of satisfaction after meals was another area where participants noted a difference. Participant 4 recounted her experiences of eating British food explaining:

"...but honestly, sometimes when I eat British food, I don't feel as full or satisfied as when I eat my traditional food. It's not just about the quantity, but the feeling after you eat. When I eat our food, there's this deep satisfaction, like you know you've eaten something substantial. Here, it's different. I can eat a whole meal, but I still feel like something is missing, like I haven't really eaten. It's hard to explain, but it's definitely something I've noticed since I moved here." P4

These reflections emphasise the significance of cultural food preferences in influencing dietary choices, especially in a new environment where familiar foods and flavours may not be as available. The participants' experiences evidence the complexities of adapting to a new culinary landscape, as they strive to find equilibrium between preserving their cultural dietary traditions and embracing new food environments.

6.4.2.2 Category: Cultural and Social Influences

The participants' narratives revealed that cultural and social influences profoundly shape their food practices, with two sub-categories: **family dynamics and cultural eating as part of identity**.

6.4.2.2.1 Sub-category: Family Dynamics

The influence of family on food choices was significant both prior to and following migration, although the dynamics evolved alongside the environmental changes. Before migration, the food preferences of family members, including children, partners, and extended relatives, played a crucial role in meal planning and preparation. However, after relocating, the impact of children's preferences, schools as cultural influences, and partners became increasingly evident.

For instance, one participant adapted her cooking habits to accommodate her children's evolving tastes: *"Basically, because my children, who kind of dictates, I take into account their*

preferences as well. You know, so, most of the things that they eat in school, you know, kind of different from what they eat growing up. So, I had to adapt based on, you know, what they eat."
P1.

Participant 10 faced challenges where her child refused to eat vegetables, leading her to prepare separate meals: *"One of my boys, he doesn't like vegetables. So when I cook like fried rice, I also cook his own separately... I have to make separate foods."*

Similarly, the influence of partners on food choices remained consistent but adapted to new circumstances. One participant noted that even in the UK, she still avoids cooking dishes her husband dislikes: *"Here in the UK it's still the same. I do not still cook what he does not like to eat. The other day, I cooked Asaro, I saw it online and I made it. He didn't like it."* P12

Social influences also shifted post-migration, as the presence of friends, which previously encouraged eating out frequently, diminished. This change is reflected in one participant's experience: *"Back there, back home, it's friends, they used to influence my eating out. There was always something to celebrate... but back here, no friends per se. So the only reason I ate out September last year was because a friend was having a birthday and I needed to... do that in honour of her, you know."* P10

6.4.2.2.2 Sub-category: Cultural Eating as Part of Identity

Cultural foods transcend basic sustenance; they are intricately connected to the cultural identity and heritage of those who partake in them. These traditional meals play a vital role in connecting participants to their roots, fostering a sense of continuity and belonging, even amidst a new environment.

Participant P9 captures this sentiment *"My traditional meals are like everything to me. This is something I grew up eating; this is something that has shaped my life into what I am today. It's not just food; it's a connection to my roots, to my culture, to my family. When I cook and eat my traditional meals, it's like I'm bringing a part of my home with me wherever I go. It's my food, and I can't do anything about it. It's who I am, and even though I'm living here now, that part of me will never change. My traditional food is everything to me, and I will always hold onto that, no matter where I am."*

This emotional and cultural connection to food underscores its role in maintaining cultural identity and continuity. Participant P9 further emphasises the importance of food in preserving cultural identity, reflecting, *"My food is a sense of identity. I think that's why I often always touch base with it. It gives me a sense of identity. I feel like now the noise I'm making is because I know that I can still have access to it. And yeah. And that's if I lose it. If I probably relocate to where I don't totally have access to my food, I will miss it. I would miss it so much. So, it gives me a sense of, you know, cultural identity. And yeah. That's what it means to me."*

The experience of migration also brought challenges, particularly in the perception of cultural foods by others. A participant recounts the initial embarrassment felt when introducing traditional foods in a new cultural context: *"To be honest, I was embarrassed when I first moved here. People would look at my food and think it was strange, and I felt a bit ashamed. But the truth is, it's my food, and I enjoy it. I shouldn't have to apologise for that. Over time, I've realised that I don't need to be embarrassed. I love my food, and it's a big part of who I am."* P1

These reflections demonstrate the cultural and emotional importance of traditional foods, serving as a connection to the past and a vital component of personal and cultural identity in the present.

As Black African women navigate through new environments, their dedication to maintaining and celebrating their cultural food practices continues to be a central part of their lives, underscoring the enduring significance of food as a cultural and social anchor.

6.4.2.3 Category 3. Acculturation

Acculturation was constructed as a main category, underscoring its importance in shaping dietary behaviours. This category highlights the lived experiences of these women as they navigate a new cultural environment, demonstrating how these adaptations affect their food choices and cooking preparation practices. This section explores the different sub-categories that characterise the concept of acculturation, focussing on the **adaptation of dietary habits, the psychological impact of acculturation, and the shift in food preparation responsibilities**. These sub-categories highlight the multifaceted influence of acculturation on dietary decisions and emphasise the broader implications for individuals as they navigate the challenge of preserving cultural traditions while adjusting to a different environment.

6.4.2.3.1 Sub-category: Adaptation of Food Habits

Following migration to the UK, Black African women experienced a process of acculturation and adaptation that shaped their dietary choices. They began exploring British cuisines while seeking local alternative for traditional African foods. The convenience and availability of these alternatives play a significantly role in this transition. One participant noted, *“I think that the UK food can be adapted quite well, maybe I would say quite easily, but I can say easily could be adapted to us. It won't be the same thing, but it can be adapted... For example, Nigerians like to eat jollof rice... you can get all of the condiments that you need to use to cook that. Now, if you want to adapt to the UK kind of food, then you can get the soft chicken and find a way to season it in such a way that it will still be acceptable.” P8*

Participants also adapted by using available local ingredients as substitutes for those they were accustomed to back home. As one stated, *“Most of our soups in the South-South are just based on vegetables... And most of the times that I would want to cook that, I'll find that the water leaf that has arrived has been wilted and just horrible... So, they've adapted the kale, they've adapted the spinach, you know, to act like, you know, one of the vegetables in the food.”* P1 Another added, *“Whenever I want to eat Egusi soup... here in the UK, we need to use spinach, because spinach is what is available in the store.”* P5

This process of adaptation also extended to broader dietary habits. A participant described, *“Recently I started... I developed the habit of having oats in the morning, unlike what I would usually have, um, probably the Nigerian yam and egg sauce, and all of that, I moved to oats in the morning...”* P9. Over time, some participants found themselves integrating more into the British lifestyle, as one explained, *“I think I have kind of integrated into the system. To be honest, I think I've kind of blended... I think I eat very okay... I would have, maybe when I first came, I would have always craved my Nigerian meal... but for me, I think I've kind of integrated into the system a bit, and I'm happy to eat my home meal... every Sunday.”* They further noted a shift in taste preferences, saying, *“Yeah, and the Westernised kind of food, for instance, um, I would eat fish and chips, and, uh, before now, I would have complained about it, but now, I don't see any problem with it, yeah, it's something I'm happy to eat...”*

6.4.2.3.2 Sub-category: Psychological Impact of Acculturation

The stress and anxiety linked to migration and the challenges of adjusting to a new environment, notably influenced by participants dietary behaviours. Many women resorted to food as a coping mechanism, with some engaging in emotional eating behaviours. This shift often involved increased consumption of unhealthy foods, as one participant revealed, *“...I had a really*

horrible habit of eating biscuits, even in Nigeria, but here, it just spiralled out of control, and I feel like sometimes it was like stress-eating... I'm just gulping [fizzy drinks] down, yeah, because it's easy, and you feel like, oh, I just want a shot of sugar to just, you know, get you going..." P4.

Another participant acknowledged, *"I think that's basically it, and there's a lot of stress, there's stress, there's a lot of being anxious, and some people kind of react to that by, you know, eating more, yeah..." P1*

These experiences illustrate the intricate relationship between environmental adaptation, psychosocial factors, and dietary behaviours following migration, emphasising the importance of addressing both the physical and psychological needs of immigrants as they navigate their new surroundings.

6.4.2.3.3 Sub-category: Shift in Food Preparation Responsibilities

The migration experience led to notable changes in how food preparation responsibilities were divided among the households of participants. In their countries of origin, these roles were typically clearly defined and backed by an extended network of family members, such as parents, maids, and other relatives. However, after migrating, participants faced a stark reduction in available help, as their partners' involvement in meal preparation became sporadic. This transition underscores the changing dynamics of household roles and responsibilities as a result of migration, along with the necessary adaptations required to maintain traditional dietary practices.

Before migration, participants often relied on a robust support system for domestic tasks.

Participant P1 noted the dramatic change in daily responsibilities after migration, stating, *"... But*

here, you have to do everything yourself, you know. And when I think about the fact that I would have to do everything myself, I just give up."

Similarly, P10 reflected on the availability of help back home: *"...Why I said there's kind of like help when I was in my home country. So, I would have the opportunity to kind of delegate the responsibility in my home country to somebody if I wanted to. So, you'd have somebody who would probably help you cook, you know, and help you run some of those errands."*

"Well, back in Nigeria, again, I would be, I would be mostly the one who will do the, the, the, the cooking. I would definitely do the cooking. But there are times that you do get help, you get, you get helpers around the house that could, help with the shopping of the, that could go to the market for you. So, so that, that is the difference in back in Nigeria, that you would get people, family members or people who are domestic workers, that would, that would do some shopping for you." P4

The shift was particularly challenging for women, who expressed the difficulty of adapting to new circumstances: *"Now that I'm in the UK, I am solely responsible for myself. I have to do everything on my own...cooking, buying my foodstuff, everything. It's a big change from what I was used to back home, where I had help. Even though my partner helps sometimes, it's not the same. Most of the time, I'm the one doing everything, and it can be overwhelming. But I'm getting used to it. It's just part of the adjustment to living here." P5*

For some, this experience involved a heightened burden of food preparation responsibilities, primarily stemming from a lack of support networks and limited partner involvement, which had been more available in their home countries but was lacking in the UK. The additional responsibility of preparing foods from scratch increased the overall burden and stress linked to

maintain traditional dietary practices in a new environment. The challenges identified by participants emphasise the necessity for robust support systems and resources aimed at improving eating habits and preserving cultural culinary traditions, as illustrated in the quotes below.

... "I want to make Moi Moi... I went to the shop to get some stuff, and I stood in front of the bell pepper (laughs), and I was contemplating, should I buy this bell pepper, will I be able to make the Moi Moi, won't the bell pepper spoil before I'm able to... you have to soak the beans... here it has gotten a bit different, so in Nigeria, you had to pick the beans, soak it, dehaul the beans, blend it... now you just have to soak it, blend it, blend the pepper, put everything in... I like Moi Moi that has been made with leaves, so you now have to prepare leaves, oh my god, then you have to cook it." P1

... "Specifically Nigerian dishes, the preparation time can be quite long... particularly for people who do not have that time. If they are working full time and have children, and their husband or partner is also working, it will be a challenge. But there are ways to overcome that, like preparing things halfway and putting them in the freezer, and then finishing cooking when you're ready... bulk cooking and getting some of them halfway done reduces the amount of time you're cooking from scratch." P10

These narratives illustrate the broader impact of migration on household dynamics, particularly the reallocation and increase of food preparation responsibilities, necessitating significant personal and familial adjustments.

6.4.2.4 Category: Barriers to Healthy Eating

The barriers to healthy eating illustrate the difficulties encountered by Black African immigrant women in the UK in maintaining healthy dietary habits. This category emphasises the structural and practical barriers these women face in their new environment. This category identified two major sub-categories: the first focusses on the **accessibility, affordability, and availability of healthy foods**, while the second examines the **influence of work and living constraints on food choices**. The identified barriers reflect the constraints posed by limited access to affordable healthy foods, alongside the challenges of demanding work schedules and housing conditions, which hinder opportunities for healthy eating.

6.4.2.4.1 Sub-category: Accessibility, Affordability and Availability

Economic factors

The influence of economic factors, particularly the inflation of food prices and the financial pressures associated with living costs, shaped the dietary choices of participants. The economic challenges frequently compelled individuals to reduce both the diversity and quantity of food items they purchased, as they navigated the tension between their dietary preferences and financial constraints. This highlights the essential role of economic stability in ensuring access to a diverse and culturally suitable diet.

Participant 9 described the impact of fluctuating food prices on their budget, *"I have this whole 20, 30, 50 kind of budgeting system, where I use 30% of my income to buy foodstuffs for a month. But the cost of living hasn't been consistent. This month it can be 30% of my income, next month it's different, because the prices of things are skyrocketing."* This inconsistency in costs underscores the strain on household budgets, particularly when trying to maintain a balanced diet.

Another participant (P4) highlighted the disparity in food pricing, pointing out that while some commodities in the UK were relatively affordable, *"African things here in the UK, they are ridiculously expensive."* This reflects the additional financial burden faced by those seeking to maintain their cultural food practices in a new environment, where the cost of culturally specific ingredients is significantly higher.

The increasing cost of food over time was a recurring theme. Another participant recalled, *"In 2020, I used to budget like 70 pounds a week, and it would be enough... But now, it's like 100 pounds or more in a week... and your bag is still empty... and I try as much as possible, you know, to cut down... so there are loads of things that I don't eat now that we used to have. But it's still expensive. So everything, everything is expensive...everything is really expensive."* P6.

This shift in food costs over a relatively short period has forced participants to make difficult decisions about what they can afford to eat, often sacrificing variety and quality.

For some, the economic strain was compounded by the need to prioritize other essential expenses over food. A participant explained, *"I have to first settle priority bills before thinking of food. I also need to prioritize my transportation so that I could go to work... to complete my shifts and get more income."* P9. This situation, where food becomes a secondary consideration after other essential costs, further illustrates the challenges posed by financial instability.

Overall, these findings underline how economic factors, particularly rising food prices and financial stress, have an impact on the ability to maintain a healthy and culturally appropriate diet. The necessity to allocate limited resources across various essential needs often results in compromised dietary choices, emphasising the need for greater economic support and stability.

Variations in Availability, Quality, and Cost of Cultural Foods

Black women shared their experiences concerning the significant shifts in the availability, quality, and cost of cultural foods after migrating to the UK. Their accounts highlighted the transition from the once easy access to fresh and affordable foods in their home countries to the current challenges, including increased costs, limited availability, and concerns regarding the quality of imported ingredients. One participant lamented *"most of the times that I would want to cook that, I'll find that the water leaf that has arrived has been wilted and just horrible, you know."* Another expressed frustration, saying, *"For instance, fish, you know, you want dried fish for the quality that has arrived is horrible."* P1

Although some women acknowledged that most foods could be found in the UK, they emphasized the impact of cost and freshness on their choices. One woman noted, *"I do not think there's anything I'll eat back home that I want to eat here that I can't find. It's all about the costs. Maybe not as fresh as I'll get some things, not everything. I think you'll get them if you find them"* P11. Yet another added that *"you can get almost anything that you want to cook or I mean as a family, what we cook, we can get almost anything in the market."* P6

However, challenges remain, particularly in terms of cost and availability. As one participant explained, *"Okay, so, with regards with getting food from my home country, or the type of meals we eat from home country, it has been quite a challenge, when it comes to the cost, when it comes to the cost, and the availability, of course it's not as available as it is in my home country, you just have very limited shops and all of that."* P4.

Another reinforced this *"So, when it comes to availability, it's, it's, you don't, like, see it every, at every turn, you have to like, go to certain places, and very limited, and still, the cost is on the*

high side, but you can't, or I can't rather, say, because of the cost I would not try to, still be like home, even in a foreign country, I still try to get my home food, no matter the amount and all of that." P9

One participant even mentioned the mental toll of not being able to access desired foods: "...*And if it's something that I feel like I can't get, it would be on my mind for some time. I just let it go because I mean, there's nothing you can really do about it.*" P1

The contrast between shopping experiences in their home countries and the UK was also notable. "*In my home country, we have markets, at every, nook and cranny, like, you don't have to go too far to get anything, to be honest, and usually I would shop on the Saturdays, going to the market, going to buy things like peppers, tomatoes, fish, meats, everything is just within, like, a stone throw from, like, where I stay, very easy to buy things, very cheap, or relatively cheap, everything I want is there.*" P9

Another added, "*Unlike home, you just go to the market and you know you can get everything that you want. But here, you cannot go to a shop, with at least you can get everything that you want. So it's more like you have to move from one place to another and here in UK, the shops are far from themselves.*" P6

Interestingly, some participants found certain aspects of shopping in the UK less challenging compared to their home countries, noting the convenience of having multiple products under one roof in larger stores. One participant explained, "*I think it's less challenging shopping here in the UK because most of these stores you get everything you want under one roof... once you enter an Aldi store, you can get basically every household item you want.*" P7

However, the high cost of cultural foods in the UK remains a consistent challenge, particularly for those desiring to maintain a traditional diet. One participant observed, *"For someone who wants to eat typically Nigerian food all the time, they will struggle because the prices are quite high... these things are imported in. They're not grown locally... so, the prices are quite high for an average earner."* P8. Another added a health perspective, saying, *"I want to be healthy, I want to eat healthy, but I do not like these options... if I was living probably in Nigeria... I would have access to vegetables that are probably more healthy in terms of the beneficial properties."* P1

6.4.2.4.2 Sub-category: Work and Living Constraints

Time

African women faced considerable challenges in maintaining healthy dietary habits, influenced by time constraints, demanding work environments, and the intricacies of modern living. The busy lifestyles life and the time-intensive nature of traditional cooking practices proved challenging to sustain. Additionally, the sedentary nature of their occupations, coupled with unfavourable weather conditions, contributed to reduced physical activity levels. Furthermore, the acceptance of traditional foods in work environments or communal living areas played a role in shaping their dietary practices.

P1 reflected on the differences between Nigeria and their current environment: *"Back at home, you have people helping you, so you don't really consider time... you have paid help, so they would have helped you prepare this stuff, and you just come in at any time you want, and you do it. But here, I'm going to be working till 5 p.m., by 5 p.m. I am exhausted... I used to use Saturdays or Sundays to cook massive amounts of food, but I found that I would feel really*

exhausted by the beginning of the next week, just tired, just really tired, you know, so you don't have time."

... "I get to work... leave my house, um, 6 a.m., I come back 9 p.m., so I have no choice than to... order for food and eat... it helps you with the stress and just get it over with." P6

The social environment also played a role in shaping dietary practices, P9 shared their experience of cooking traditional food in a shared kitchen: *"I would cook one of our delicacies, Egusi soup... I remember cooking it in the kitchen and other nationals will come to spray perfumes, hahaha...it was a bit embarrassing.... after that, to be honest, I was like, do I really want to do this again?... so, as much as I would like to cook my traditional meal every day, I do not want to inconvenience people as well, so I try to balance it.... I had to step back a bit, and, uh, probably eat it [traditional foods] once in a while, and incorporate meals that are 'more accepted' like pasta, pizza and oats."*

Convenience and Shortcuts

In adapting to the demands of their new environment, women increasingly turned to convenience and shortcuts in their dietary practices. This transition involved preparing meals less often, increased frequency of dining out, relying on food delivery services, and choosing convenience meals. The adaptations emerged from the need to identify practical solutions that balance the challenges of modern living while desiring to maintain traditional dietary practices.

One participant noted the stark difference in their eating habits after migration: *"Back home, I did not eat as much junk as I eat here. And then the lifestyle...you're going from one job to the other or from one class to the other. You will just grab a drink and burger and some fries, you know, you just eat on the go."P6*

Another participant reflected on the prevalence of fast food in their new environment:

“McDonald's... is very rampant here in the UK. So, we have burgers, you have fries, you have all of that. In addition to local meals, which is really big, you know... There's a lot, there's a massive amount of unhealthiness... and no physical activity because that has been truncated by industrialisation.” P1

The change in habits also extended to ordering food, which was not a common practice before migration: *“In Nigeria, I'm not sure if I ever really... I have, but it's not something that I grew up ever doing. There were always meals at home, not just cooked meals, but ingredients readily available to cook. It's never really been in my culture or habit to order food. All this came up when I came to this country.” P9*

Participants emphasised how time constraints and the ease of access to convenience food influenced their dietary choices: *“The ease, honestly... aside from ease, time constraints, affordability, and then generally ease. You work, you're always working, you have to work to make money, and by the time you're back home you're knackered... and even if you try to gather the strength, you realise that you've not shopped for that whole week, and you don't have anything to cook... living as a single person, you are not really encouraged to prepare meals.”*

P9 further highlighted the cumulative effect of these changes: *“I think diets change after migration for the worse... as you go forward, you're learning bad habits... you're working, you need to eat... and you have easier ways to order for food, there's delivery in your app, you don't have to stress... You turn left, there's McDonald's, you turn right, there's KFC... it's very easy to order things, I don't think it gets any better ooo [emphasising].”*

6.5 Discussion

This present study sought to explore the factors that influence the dietary choices of Black African immigrant women living in the UK. The findings of this study revealed a multi-layered interplay of individual, cultural, social, and environmental influences that shape dietary behaviours. The results are consistent with broader patterns noted in immigrant nutrition studies, particularly regarding the influence of acculturation on dietary habits. This discussion is structured to provide a full understanding of the dynamics involved, focussing on the main constructed categories: individual characteristics (health orientation and personal food preferences), cultural and social influences (family dynamics and cultural eating as part of identity), acculturation (adaptation of food habits, psychological impacts, and shifts in food preparation responsibilities), and barriers to healthy eating (cost and availability, and work/living constraints).

6.5.1 Individual Characteristics: Health Orientation and Personal Food Preferences

This study revealed that participants showed a nuanced health orientation, acknowledging the impact of their dietary choices on well-being, yet struggles in applying their health knowledge due to environmental and personal constraints. The contrast between awareness and practice is reflected in Rosenstock's Health Belief Model (1974), highlighting how the gap between knowledge and behaviour is often mediated by perceived barriers to change. Similar to the findings of Asamane et al. (2019), which found high health knowledge among ethnically diverse older adults, this study reveals that the women's ability to act on this knowledge was hindered by situational barriers, including the high cost of culturally appropriate foods and limited time for food preparation resulting from work and family responsibilities. These findings notably challenge the stereotype that immigrant populations lack nutritional awareness, substantiating the

work of Tiedje et al. (2014) and Nicolaou et al. (2009), who reported that sensory appeal and personal food preferences are crucial in maintaining traditional diets despite acculturation pressures. In contrast to some studies that report lower health literacy among certain immigrant groups (Tiedje et al., 2014), the participants in this present study demonstrated an awareness of healthy practices, likely due to their higher educational levels. However, they encountered barriers to implementing these practices, highlighting how socioeconomic factors and environmental constraints can override individual health orientations.

Furthermore, the participants highlighted the significance of well-seasoned, flavourful foods, which underscores the cultural and sensory value of traditional cuisines. This observation is consistent with the findings of Nicolaou et al. (2009) and Ojo et al. (2023), who noted that sensory preferences often play a crucial role in the retention of traditional foods, even when individuals find themselves in new environments. In contrast to populations where dietary acculturation typically leads to a nearly total shift towards the foods of the host culture, the findings presented here indicate a more selective process. Taste preferences and cultural connections continue to play a significant role in food choices, even in the face of logistical challenges. This nuance suggests that dietary acculturation is not merely about adopting new dietary patterns; it entails a deliberate balancing of health orientation alongside cultural and sensory preferences, frequently influenced by barriers associated with affordability and access.

6.5.2 Cultural and Social Influences: Family Dynamics and Cultural Eating as Part of Identity

The significance of food as an anchor of cultural identity was evident among participants, with traditional dishes serving as both nutritional sustenance and a source of psychological comfort. This finding is consistent with the work of Kittler et al. (2011), who highlighted the role of food

as a cultural touchstone that preserves identity in immigrant communities. Through the adherence to traditional diets, Black African women in this study successfully upheld cultural continuity, offering psychological stability in a new environment. This observation aligns with the findings of Gichunge and Somerset (2011), who found that traditional foods provided emotional comfort and a connection to heritage for African immigrants in Australia, highlighting how dietary choices can act as a form of resistance to complete cultural assimilation.

In addition to the preservation of cultural identity, family dynamics played a significant role in shaping dietary practices, especially through the evolution of responsibilities and changes in household roles. The redistribution of food preparation responsibilities within immigrant families, shaped by factors like children's preferences and the involvement of partners, reveal a reconfiguration of conventional gender roles. These changes mirror the findings of Hyman et al. (2002), who observed comparable changes among immigrant women in Canada, indicating that migration catalysed changes in household dynamics, especially concerning food preparation and decision-making processes. The observed changes also align with the principles of Social Cognitive Theory (Bandura, 1986), where reciprocal determinism between the individual, their environment, and behaviour indicates that new social contexts can modify personal and familial roles. Notably, both Gichunge et al. (2016) and Hyman et al. (2002) observed the persistence of cultural foods in immigrant families. This study builds on those insights by demonstrating how family dynamics, particularly through the role of children, can shape dietary choices. The impact of younger family members on the adoption of new dietary patterns reveals a subtle conflict: as women strive to uphold cultural food traditions, the children's exposure with the dietary norms of the host country brings about a need for compromise. Consequently, food practices emerge as

sites for negotiation between the preservation of culture and the need for adaptation, with family dynamics playing a pivotal role in shaping dietary choices.

6.5.3 Acculturation: Adaptation of Food Habits, Psychological Impact, and Shift in Food Preparation Responsibilities

The process of dietary acculturation in this study illustrates the principles outlined in Berry's (1997) framework, highlighting how individuals balance the integration of host culture practices while retaining their original cultural characteristics. However, while participants demonstrated a clear inclination towards traditional foods, they encountered practical barriers, including high costs and limited access to these foods, which occasionally led to dietary compromises. This selective acculturation process corresponds with previous findings that dietary acculturation among immigrants often entails a fusion of host and traditional food practices (Satia-Abouta, 2003; Wandel et al., 2008). In contrast to previous studies that indicated a more direct embrace of host culture diets, this present study revealed that the adaptation of Black African women was characterised by a more selective approach, significantly shaped by psychological and practical constraints. This selective retention illustrates the psychological effects of acculturation, where traditional foods act as a source of comfort and a means of cultural expression in the face of the challenges associated with adjusting to a different environment.

As earlier highlighted, women emphasised the changes in food preparation responsibilities, underscoring how migration has transformed gender roles and household dynamics, subsequently influencing dietary choices. The redistribution of household roles, especially those concerning food-related tasks, can be analysed using Family Systems Theory, which suggests that families modify their roles in response to evolving circumstances (Broderick, 1993). This

study reveals that changes in family roles impacted food preparation and created new tensions between maintaining cultural traditions and adapting to the dietary norms of the host culture. These changes reflect a re-negotiation of household roles during the acculturation process, as women's responsibilities evolve to meet economic pressures and cultural expectations.

6.5.4 Barriers to Healthy Eating: Accessibility, Affordability, Availability, and Work/Living Constraints

Participants identified several critical barriers, primarily linked to the food environment in the UK, such as issues concerning accessibility, affordability, and the availability of culturally appropriate foods. Increased cost and limited availability of traditional foods often compelled women to alter their diets in ways that were inconsistent with their health goals. This finding supports the observations made by Dweba et al. (2018), who noted that economic constraints often result in food insecurity and lower diet quality within immigrant communities. The restricted access to cultural foods in the UK intensifies these economic constraints, echoing the findings of Renzaho and Burns (2006), who reported that Sub-Saharan African immigrants in Australia encountered similar difficulties in accessing culturally appropriate foods.

The economic pressures and constraints of the food environment prompted participants to turn to convenience foods, highlighting the influence of urban living on dietary choices. Popkin (2006) observed a worldwide trend towards convenience and processed foods, a concept evident in this study where time constraints and work obligations led women to rely more on convenience foods compared to their home countries. This “nutrition transition” illustrates a broader socio-environmental shift affecting dietary practices worldwide, particularly in urban areas where limited time and high costs discourage traditional cooking. The reliance on convenience foods is

further substantiated by Asamane et al. (2019), who found that urban living conditions, food access, and time limitations shape dietary choices among ethnic minorities in high-income countries. Thus, the environmental constraints identified in this study suggest that immigrant women's dietary practices are influenced not only by cultural preferences but by practical limitations that compel them to adapt in ways that may undermine their health orientations.

6.5.5 Implications for Public Health Interventions

This study's findings hold considerable importance for public health initiatives focused on improving the health outcomes of immigrant populations in the UK by dietary and lifestyle changes. Existing interventions often emphasise general nutrition advice, yet they tend to overlook the socio-economic and environmental constraints—such as cost, availability, and access to culturally appropriate foods—that play a crucial role in shaping the dietary behaviours of immigrants. Studies have consistently demonstrated that conventional public health strategies may not successfully engage immigrant communities unless they are adapted to account for cultural preferences, dietary habits, and social realities (Ojo et al., 2023).

For instance, the HEAL-D program (Moore et al., 2019) and the Eat for Life trial (Resnicow et al., 2001) provide important frameworks for intervention that directly tackle these factors. The HEAL-D trial aimed to promote dietary changes in African and Caribbean communities, highlighting the importance of community engagement and cultural significance in its approach. The program effectively engaged participants by incorporating MI techniques along with culturally tailored content, enhancing long-term health behaviour changes relating to diet. In a similar vein, the Eat for Life trial targeted African American women in the US, tailoring dietary education to resonate with participants' cultural practices and local food environments, resulting

in improved dietary outcomes through culturally attuned delivery methods (Resnicow et al., 2001). Both programs highlight the important role of community spaces, familiar food practices, and culturally relevant messaging in effectively engaging immigrant populations and fostering healthier eating habits. The effectiveness of these interventions is backed by evidence showing that individuals engaged in programs that take into account cultural context and offer locally relevant food options are more likely to make lasting changes to their dietary behaviours (Kreuter et al., 2003; Resnicow et al., 1999). This body of evidence indicates that public health initiatives aimed at Black African women in the UK may also gain from incorporating culturally relevant methods, especially regarding food availability and family-based dietary practices.

Additionally, strategies on improving food access and affordability, including local food cooperatives or culturally specific food assistance programs, have the potential to effectively address the barriers highlighted in this study. For instance, studies by Dweba et al. (2010) and Caraher and Cavicchi (2014) show that programs addressing food insecurity in immigrant populations can alleviate economic barriers to healthy eating. Programs that integrate these kinds of solutions, in conjunction with culturally relevant nutrition education, are more likely to tackle the full spectrum range of barriers that affect dietary habits. Leveraging community-driven solutions, like the establishment of culturally relevant food spaces and encouraging collaboration between community members and health professionals, public health initiatives can more effectively support Black African immigrant women in making healthier dietary choices.

Finally, considering the significant role of family dynamics on dietary habits, it is essential for public health strategies to include family-based approaches that involve household members in promoting healthy eating practices. This may encompass educational initiatives aimed at addressing the nutritional requirements of children and adults alike, along with programs that

encourage the shared distribution of domestic responsibilities to reduce the burden on women (Bhatia et al., 2022). Interventions centred around family dynamics would not only promote healthier eating habits but also address the gendered aspects of food preparation and decision-making that influence dietary choices in immigrant households.

6.5.6 Implications for Further Research

The findings of this study, which highlight the unique dietary challenges encountered by Black African immigrant women in the UK, as well as the need for continued research that is culturally, economically, and socially adapted to the UK context. The previously discussed interventions such as the HEAL-D programme and the Eat for Life Trial, demonstrate the significance of culturally sensitive strategies in promoting healthier dietary habits within African and Caribbean communities. Nonetheless, these interventions mainly focused on diabetes management or specific dietary outcomes, resulting in gaps in the comprehensive understanding of how to address the diverse needs of immigrant populations. This calls for further investigation into how these culturally tailored models can be adapted and expanded for broader health outcomes, including the reduction of obesity, hypertension, and cardiovascular disease, as well as the improvement of overall mental health and well-being, particularly among Black African immigrant women.

Future studies should prioritise examining behaviour change models that have demonstrated potential in various contexts, including SCT, TTM, and the COM-B model, which underpins behaviour change interventions. These models offer important frameworks for understanding the influence of cultural and social factors on health behaviours. While MI serves primarily as a technique rather than a theoretical framework, its application within the COM-B model can

effectively facilitate discussions with Black African women regarding their ambivalence towards dietary changes (Makin et al., 2021). Considering the economic and social barriers encountered by Black African immigrant women in the UK regarding access to culturally appropriate foods, it is essential for research to explore the development of interventions that are both economically and socially accessible. This may encompass exploring the effectiveness of community-based programs such as food cooperatives or culturally specific food banks. These programs have the potential to address the challenges highlighted in this study, including the barriers to accessing affordable, familiar foods in the UK.

Moreover, a longitudinal study would provide valuable insights into how dietary behaviours evolve overtime as Black African immigrant women adjust to their new socio-economic environment. These studies would be crucial in evaluating the long-term impact of culturally adapted interventions and identifying ways to enhance these approaches to facilitate dietary and lifestyle modifications through the different stages of integration into British society.

Furthermore, there exists considerable scope for research into the role of digital health platforms, including eHealth and mHealth, in promoting healthy eating habits among Black African immigrant communities. As technology increasingly influences health behaviours, exploring the cultural adaptation and application of digital interventions to engage this population presents an innovative opportunity for improving dietary practices (Patel et al., 2019). This investigation could examine the potential for mobile applications or social media platforms to convey culturally relevant health messages, facilitate peer support, and present practical advice on healthy eating, all in a more flexible and accessible manner.

In response to the findings from this study and consistent with previous studies conducted within this PhD program, the ‘Black African Lifestyle and Nutrition Change for Empowerment and

Development’ (BALANCED) intervention has been developed. This theory-driven, evidence-based program, is specifically designed to address overweight and obesity among Black African women in the UK. Grounded in the challenges identified in this study—cultural preferences, socioeconomic constraints, and barriers to accessing affordable, culturally appropriate foods—the BALANCED program aims to offer a comprehensive solution. The intervention integrates an understanding of cultural sensitivity with practical approaches to address the unique dietary and lifestyle challenges encountered by this group. Chapter 7 of this thesis presents a comprehensive framework for the design and implementation of the BALANCED intervention, including its theoretical foundations, key strategies, and actionable steps. The intervention incorporates knowledge from recognised behaviour change techniques and models, including MI and the COM-B model. By incorporating both individual and environmental factors that shape dietary choices, the BALANCED intervention seeks to promote sustainable health behaviour modifications among Black African women with overweight and obesity in the UK.

6.6 Strengths and Limitations

This study stands out as one of the few studies that directly explores the dietary behaviours of Black African immigrant women in the UK, filling a crucial gap in existing literature. This study sheds light on an overlooked and under-researched population, enhancing our comprehension of dietary habits and health outcomes within immigrant communities. This distinctive focus amplifies the significance of the results and highlights the importance of exploring the dietary experiences of diverse populations.

A notable strength of this qualitative component is rooted in its basis in an interpretivist philosophy. This approach allows for an in-depth exploration of participants' subjective experiences regarding their eating behaviours. By prioritising the meanings attached to food choices, the study adeptly reveals the complexities of individual and cultural factors that influence these behaviours. Interpretivism promotes a profound understanding of the social and contextual factors at play, enabling an exploration of how identity, culture, and personal experiences intersect, by the researcher. This emphasis on meaning-making enriches the data collected and ensure that the findings align with the lived experiences of the participants.

This study's strengths are further amplified by cultural and contextual sensitivity. Utilising a constructivist approach, the study recognises the significance of the historical and cultural contexts of the participants, which play a vital role in influencing their dietary choices. The researcher's own background as a Black African immigrant woman enhances this sensitivity, fostering a deeper connection with participants and leading to richer, co-constructed narratives. This element reduces potential biases and ensures that the findings genuinely represent the participants' viewpoints, fostering a detailed comprehension of their experiences.

Thematic analysis, chosen for its flexibility, represents an additional strength of this study. This method facilitates the identification of patterns and themes that resonate with the lived experiences of participants. In contrast to other methodologies, like ethnography or grounded theory, which can impose more rigid frameworks, thematic analysis allows for a focus on individual perceptions and personal factors that affect dietary behaviours. This flexibility complements the exploratory approach of the study, facilitating a nuanced understanding of the intricacies related to dietary choice among this demographic.

The purposive sampling strategy utilised in this study ensured that participants were selected for their ability to offer rich, insightful data. The study's focus on information-rich cases, captured a range of experiences within the target demographic, including variations in age and duration of residence in the UK. This approach enriches the insights obtained, facilitating a comprehensive exploration into the dietary behaviours of Black African women. Lastly, the refinement of the interview guide through a pilot study represents a methodological strength that improves the clarity and cultural appropriateness of the research instrument. This iterative process ensured that the final data collection tool was specifically designed to meet the needs of the target population, thereby enhancing the reliability and validity of the findings.

While these are notable strengths, some limitations are inherent to this study. One limitation is the homogeneity of the sample. Despite the study's aim of achieving diversity, the recruitment process led to a group that was largely homogeneous, predominantly consisting of individuals from a particular ethnic background. This uniformity observed could limit the breadth of perspectives included, thereby hindering the generalisability of the findings to other Black African women belonging to different ethnic subgroups. Although the study's depth is preserved, the scope to understand the full spectrum of dietary behaviours among various Black African populations was somewhat limited. This study's qualitative nature also introduces inherent challenges concerning generalisability. Additionally, the limited sample size could impact the findings and may not be representative of women from different backgrounds or socio-economic circumstances.

The researcher's positionality as a member of the studied population presents both strengths and limitations. This insider perspective not only enriches cultural sensitivity and understanding but also introduces the possibility of bias. Even with the implementation of reflexivity to address

these impacts, personal experiences of the researcher may still have influenced the interpretation of the data. While the reflexive process holds significant value, it cannot fully eliminate the influence of preconceptions on the understanding and examination of participants' narratives. Additionally, while conducting interviews via Zoom is logistically practical, it may have also impeded the development of rapport and the collection of nuanced data. The absence of non-verbal cues in virtual interactions can affect how participants' emotions and body language are interpreted, which is essential in qualitative studies (Maloney et al., 2020).

Finally, there exists a potential impact of social desirability bias stemming from the sensitive nature of the subject—dietary behaviours and body image in women with overweight and obesity. It is possible that participants provided responses that conform with perceived social norms, downplaying unhealthy behaviours or exaggerating healthy habits to meet perceived societal standards. This risk may impact the depth of the data, thereby influencing the interpretation of participants' actual experiences and practices.

6.7 Conclusion

The dietary choices and behaviours of Black African immigrant women in the UK are shaped by a multifaceted interplay of individual, cultural, social, and environmental factors. These women demonstrate a strong commitment to maintaining their cultural dietary practices, yet they encounter considerable barriers that hinder their capacity to do so. The study findings underscore the necessity for public health interventions that are more attuned to cultural sensitivities, specifically targeting the unique challenges encountered by immigrant communities, especially regarding access to affordable and culturally relevant food options, as well as navigating the complexities of modern living. By addressing these gaps and incorporating a more holistic

approach, public health interventions can more effectively support the dietary health and overall well-being of Black African immigrant women in the UK.

6.8 Reflective practice

6.8.1 Reflexivity in the Research Process

Reflexivity plays a crucial role in qualitative inquiry, enabling an examination of how one's own position, perspective, and presence impact the research process (Finlay, 2002). Although reflexive practices may not fully eliminate these influences, they offer significant context and understanding for the reader, aiding in revealing unconscious motivations and implicit biases (Devine & Heath, 1999). As a researcher from a Black African immigrant background, my unique experiences and perspectives may have inevitably shaped different aspects of this study, including the methodological choices and the ultimate interpretation of the results. This reflective analysis discusses the role of my positionality during the research journey, particularly in the context of the methodologies, findings, and discussions presented.

6.8.2 Reflexivity in the Research Methods

From the outset, my experiences as a Black African immigrant played a pivotal role in the design of this study. My lived experiences as a member of the population being studied naturally align with an interpretivist paradigm that aims to comprehend phenomena through the subjective meanings that participants associate with their experiences. This philosophical approach was particularly effective in exploring the dietary habits of Black African immigrant women, as it highlighted the significance of understanding the cultural, social, and individual factors that influence these habits.

The cultural sensitivity of this study emerged as one of its key strengths, facilitated by my own insider status. I successfully developed an interview guide that was culturally relevant and utilised language and framing that resonated with the participants. The shared experiences of migration and cultural adaptation facilitated the development of rapport during interviews, promoting an environment of openness and trust. Nonetheless, this insider perspective might have led to the introduction of certain biases. For instance, my own experiences might have led me to explore specific aspects of dietary behaviours more deeply. Although this may have enhanced the data collection process, it also brings to light the potential that other equally significant facets of participants' experiences were not investigated as thoroughly.

In choosing thematic analysis as the method for data analysis, I considered the flexibility it provided in capturing both individual and collective experiences. Nevertheless, I acknowledged the possibility that my personal lens could shape the construction of themes. Throughout the analysis process, reflexivity was utilised via regular memo-writing and discussions with academic peers and 'critical friends'. However, it is important to recognise that my interpretation of the data may have been inevitably influenced by my insider perspective.

6.8.3 Reflexivity in the Interpretation of Findings

The interpretation of the findings in this study was shaped by my personal awareness of the challenges encountered by Black African immigrant women in the UK. For example, my personal experiences in navigating the UK food environment, while trying to maintain cultural dietary practices, heightened my sensitivity to the challenges faced by participants in accessing affordable, culturally suitable foods. This probably played a significant role in highlighting these

issues in the analysis, particularly concerning the broader structural and economic barriers encountered by this population.

Although my background has enabled me to recognise and relate to certain challenges, it might have also resulted in a tendency to under-explore certain areas. For instance, although I could easily relate with the stressors of balancing cultural retention while adapting to life in the UK, I might have attuned to the subtleties in the dietary experiences of participants who had resided in the UK for a longer time or who hailed from diverse socioeconomic backgrounds within the Black African immigrant community. The observed differences might have led to variability in dietary behaviours that may not have been entirely captured or thoroughly explored.

6.8.4 Reflexivity in the Discussion of Implications

In discussing the implications of this study for public health practice and future studies, I was particularly conscious of my dual role as both a researcher and a member of the studied population. This positioning enabled me to strongly advocate for culturally tailored interventions, highlighting the inadequacies of mainstream public health strategies in meeting the unique needs of Black African immigrant women. My commitment to improving health outcomes for this population is evident in the call for interventions that are culturally appropriate and economically accessible.

In reflecting on the implications for future studies, I was also mindful of my vested interest in promoting more research that focus on the experiences of Black African immigrants in the UK. Although this emphasis is justified due to the existing literature gap, it is crucial to recognise that my personal connections to the issue might have resulted in an uncritical acceptance of specific assumptions, including the universal applicability of culturally tailored interventions among

various Black African immigrant communities. Future research should therefore aim to incorporate a wider range of perspectives and experiences within this population, ensuring that interventions are not only culturally appropriate but also responsive to the diverse realities of Black African immigrant women.

6.8.5 Mitigating Bias through Reflexivity

All through this study, I utilised various strategies to mitigate the potential biases arising from my positionality. Firstly, I engaged in regular reflexive journaling to record my thoughts, emotions, and assumptions as they emerged throughout the research journey. This enabled me to examine critically, the ways in which my personal experiences could influence the data collection and analysis process. For instance, when a participant expressed their frustration regarding the lack of affordable culturally appropriate foods, I felt a personal connection to their struggles, having encountered similar challenges myself. Journaling facilitated my recognition of emotional responses while encouraging a focus on objectivity in my analysis. This reflection helped me maintain objectivity in my interpretation of the data, allowing me to analyse it from a standpoint of understanding while ensuring that personal empathy did not overshadow the broader implications of the findings. Secondly, I sought feedback from my supervisors and academic peers, especially those with different backgrounds, to offer alternative interpretations and question any assumptions I might have introduced to the study. This collaborative approach ensured that the findings were not unduly influenced by my insider perspective.

Furthermore, I recognised the importance of being receptive to the varied experiences present within the Black African immigrant community. Although my background offered important perspectives, I intentionally focused on attentively listening the participants' stories without

projecting my own experiences on them. During interviews, I made a deliberate effort to avoid leading questions that could influence participants towards the narratives I anticipated. Instead, I prioritised creating an environment where they could express their individual challenges and coping strategies freely.

In conclusion, reflexivity was a vital component in this qualitative study, enabling a critical examination of how my identity as a Black African immigrant shaped the research process. While my insider position helped build rapport and foster cultural sensitivity, it also necessitated constant self-awareness to reduce the risk of bias in data collection, analysing, and interpreting data. Through the use of reflective methods and soliciting outside perspectives, I sought to balance the strengths of my positionality with the necessity for critical distance, guaranteeing that the findings of the study genuinely reflected the experiences of Black African immigrant women in the UK. This reflective process has ultimately enhanced the study, providing a more profound insight into the intricate interplay between culture, migration, and dietary behaviours, while also emphasising the significance of continued reflection in qualitative inquiry.

Chapter 7

Thesis study map: Study 5

Study	Objectives
Study 1: Effectiveness of Client-Centred Counselling on Weight Management among Black African Women with Overweight and Obesity in High-Income Countries: A Systematic Review	Objectives: to evaluate the effectiveness of client-centred counselling on weight management in Black African women with overweight and obesity and provide information about: • specific intervention component and skills used • culturally tailored strategies, and theoretical underpinnings
Study 2: Modification and validation of the EPIC FFQ to assess dietary intake in Black African adults	Objectives: • To modify the EPIC FFQ to better reflect the dietary habits, cultural food practices, and food preferences of Black African adults • To validate the modified EPIC FFQ
Study 3: Assessment of Dietary Patterns among Black African Women from sub-Saharan Africa living in the UK	Objectives: • To determine the dietary intake and associated demographic factors • To classify dietary patterns and any associated determinants.
Study 4: A qualitative study exploring factors influencing dietary choices of Black African women with overweight and obesity from Sub-Saharan African living in the UK	Objectives: • With dietary patterns identified from study 3, investigate the factors that influence Black African immigrant women's dietary choices and eating habits.
Study 5: A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women (The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change Wheel	Objectives: • With findings from study 1, 2, 3 and 4, design a nutritional and lifestyle program targeting overweight and obesity among Black African women in the UK

Chapter 7

Study 5: A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women (The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change Wheel

7.0 Overview

This chapter outlines how findings from previous studies informed the design and development of the BALANCED (Black African Lifestyle and Nutrition Change for Empowerment and Development) intervention. Drawing insights from earlier chapters, the proposed intervention was developed on a robust theoretical and practical framework. Study 1 identified key BCTs, cultural adaptations and intervention delivery modes vital for enhancing engagement through client-centred counselling. Study 3 highlighted critical dietary patterns and the influence of acculturation on food choices, and highlighting the need for interventions that are culturally sensitive. Study 4 explored the various individual, cultural, and environmental factors that shape dietary behaviours, offering crucial insights for the development of accessible and relevant intervention components. Together, these studies ensured that the proposed intervention is evidence-based and specifically adapted to meet the needs of Black African women in the UK.

7.1 Introduction

This chapter details the protocol and design of the BALANCED intervention, an exploratory trial collaboratively developed, theory- and evidence-based program addressing overweight and obesity in Black African women in the UK. Developed in accordance with the framework established by the UK Medical Research Council (MRC) for complex health interventions (Craig

et al., 2013), the intervention adheres to the recommended stages of development, pilot testing, evaluation, and implementation; however, the latter phases are not part of this PhD program. The BALANCED program was also designed in a manner akin to the approach taken by Murphy et al. (2023) with the IINDIAGO program, which targeted women with gestational diabetes in South Africa. The MRC framework emphasises the importance of a theoretically informed approach in understanding target behaviours and the pathways to behaviour change; however, it provides minimal guidance for the intervention development phase. To address this gap, the Behaviour Change Wheel (BCW) (Michie et al., 2014) was employed, offering a structured approach for designing behaviour change strategies that are grounded in both theoretical frameworks and empirical evidence, while also taking into account the lived experiences of the target population.

The BALANCED intervention integrates behaviour change theory with co-design principles, ensuring that it is culturally tailored and context-specific. The COM-B model (Capability, Opportunity, Motivation – Behaviour), which is central to the BCW, was utilised to identify the primary behavioural determinants within this demographic, informing the choice of targeted strategies to facilitate sustainable lifestyle changes (Michie et al., 2014). This participatory approach enhances both relevance and acceptability while aligning with Stage 1 of the MRC framework, thereby ensuring a structured development process prior to the feasibility and efficacy testing in Stage 2.

7.2 Methods

7.2.1 Theoretical Framework for Intervention Development

The intervention was developed using the step-by-step methodology described in the BCW framework (Michie et al. 2014). This framework consolidates key theoretical constructs from 19 behavioural science frameworks and links them to the COM-B model, demonstrating its versatility across various behaviours and contexts. Additionally, the BCW offers a standardised taxonomy for characterising interventions and mapping the relationships between outcomes and mechanisms of change. This represents a significant advancement in behavioural science by facilitating the evaluation, replication, and comparison of diverse interventions (Michie et al., 2014).

7.2.2 The COM-B Model

As shown in Fig. 7.1, the BCW is structured in three layers. At its core lies the COM-B model, which proposes that influencing any behaviour—whether at the individual, group, or population level—requires modifying one or more of three elements: Capability, Opportunity, and Motivation. Capability encompasses both physical and psychological abilities; Opportunity includes external factors within the physical or social environment that can either support or obstruct behaviour change; and Motivation can be reflective (involving conscious thought, evaluation, and planning) and/or automatic (driven by unconscious emotional reactions, impulses, or habits) (Michie et al., 2014).

7.2.3 Theoretical Domains Framework

The three components of the COM-B model—Capability, Opportunity, and Motivation—can be further elaborated through the Theoretical Domains Framework (TDF) (Michie et al., 2014),

illustrated in the layer encircling the COM-B hub in Fig. 7.1. Capability can be broken down into various components, including knowledge, skills, memory, attention, decision-making processes, and behavioural regulation. Opportunity is classified into components including environmental context, resources, and social influences. Motivation includes various elements such as social and professional roles, identity, beliefs about capabilities and consequences, optimism, intentions, goals, reinforcement, and emotional responses.

7.2.4 Intervention Functions and Policy Options

Encircling the COM-B model and the TDF is a layer that comprises nine distinct intervention functions that are available for selection. The outermost layer of the BCW outlines seven categories of policy options that can be utilised to implement these intervention functions. Given that the behavioural components of the COM-B model can be targeted by multiple intervention functions and policy types, the inner layers can be repositioned around the central core of the BCW, allowing for flexible combinations tailored to specific needs (Michie et al., 2014).

7.2.5 Applying the Behaviour Change Wheel to The BALANCED Intervention

The BCW's systematic step-by-step approach for intervention development was followed, beginning with a behavioural analysis of the issue and diagnosing necessary changes, as identified in Chapters 2, 3, 5, and 6 and including in-depth interviews with the target group on the proposed intervention (see Appendix 10). This analysis was then linked to specific intervention functions and behaviour change techniques aimed at achieving the desired outcomes (refer to Fig. 7.2: Flow diagram for design process).

7.2.5.1 Foundational Research and Stakeholder Engagement in Intervention Development

Before initiating the development process, a thorough review of relevant research literature was conducted to identify the behavioural and broader environmental determinants of overweight and obesity (Chapter 2). Chapter 3, study 1 also revealed the types of interventions that have shown both feasibility and effectiveness. Overall, to gain a deeper understanding of the issues surrounding overweight and obesity, as well as the barriers and facilitators to behaviour change within the target population, a thorough, context-driven program of formative information gathering was undertaken (Chapter 6, Study 4; see Table 7.1). The findings from these studies offered significant insights that guided every phase of the intervention development process. Furthermore, the findings were presented at a webinar attended by stakeholders, including the supervisory team, GPs, dietitians, clinicians, nutritionists, commissioners, and NHS representatives, facilitating discussions and further interpretation. The recommendations gained from this webinar (see section 7.5), alongside the findings from the formative studies and existing literature, played a crucial role in shaping the next phases of the development process.

Fig 7.1: Behaviour change Wheel (Michie et al., 2014). Note. This figure depicts the three layers of the Behaviour Change Wheel

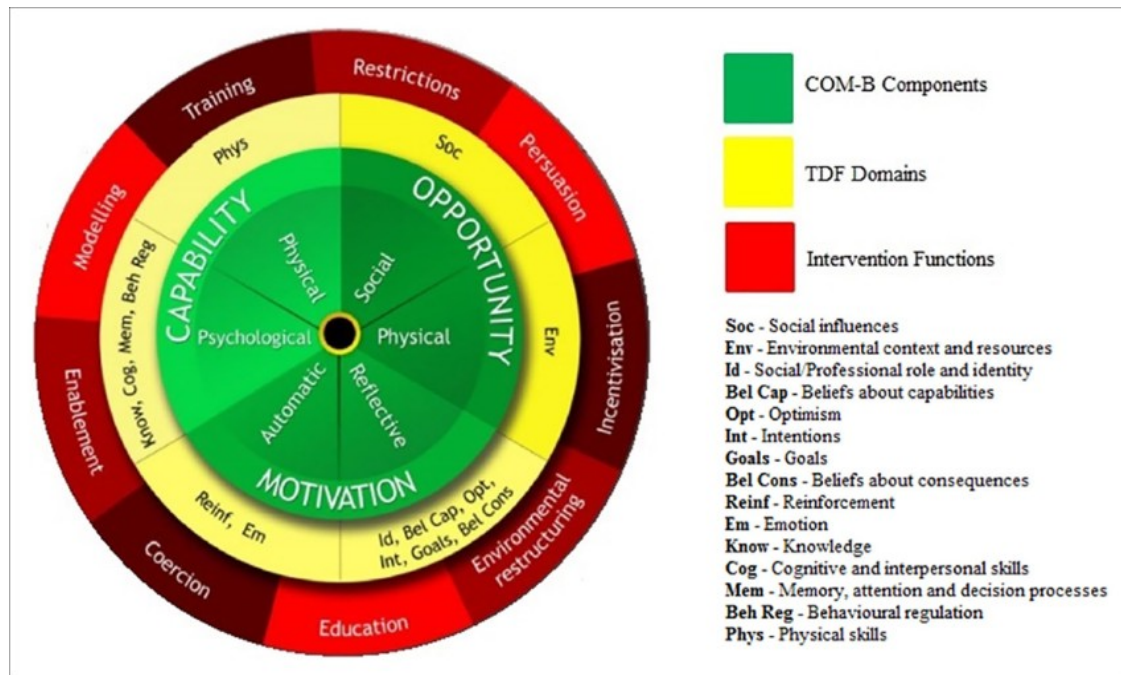


Table 7.1 Programme of Primary Data Collection to Assess Context and Target Population

1	A systematic review of all existing studies on the client-centred counselling interventions for weight management among Black African women with overweight and obesity (Chapter 3; study 1)
2	A cross-sectional study on the dietary intake and patterns of 112 black African women with overweight and obesity (Chapter 5; study 3)
3	In-depth individual qualitative interviews with Black African women with overweight and obese women in UK (n=15) to explore factors influencing dietary choices (Chapter 6; study 4)
4	In-depth individual qualitative interviews with Black African women with overweight and obese women in UK (n=15) to determine the practicality and delivery of intervention
5	Webinar with stakeholders including GPs, Clinicians, public health practitioners/managers, nutritionist/dieticians, commissioners and NHS representatives to evaluate the feasibility and practicability of the intervention

7.2.5.2 Step-By-Step Development of the Intervention

Stage 1: Understand the Problem and Behaviours

The first step requires an understanding of the problem of interest in behaviour terms. This means identifying the problem in relation to behaviours and the target population that need to be changed to address the problem of overweight and obesity. It also involves selecting those behaviours that were most likely to impact on the problem, and that were feasible to target in a health intervention. Step 2 requires selecting the target behaviour. The broad target behaviours for the intervention are the main, modifiable risk behaviours associated with the development of overweight and obesity, namely diet and physical activity.

In Steps 3 and 4 the COM-B model and the TDF were used to map out a detailed analysis of the selected target behaviours in their context and to identify what precisely needed to change in Black African women with overweight and obesity to achieve the desired change in behaviour. This was facilitated by having analysed the findings of the study (study 4) on the factors which hinder or facilitate lifestyle change post migration into HICs such as the UK, according to the main categories of the COM-B model: Capability; Opportunity and Motivation (Muhwava et al., 2019).

Stage 2: Identify Intervention Options Likely to Achieve Desired Behaviour Change

In Step 5, intervention functions were evaluated for each of the TDF domains, drawing on the nine options specified in the BCW (Michie et al., 2014). The selected intervention functions or strategies were evaluated for their practicality, feasibility, and potential effectiveness in achieving the desired behaviour changes among Black African women with overweight and obesity. Step 6 involved examining potential policy options that could facilitate the practical application of the

intervention in real-world settings. Categories of policy that outline the methods of delivering intervention types encompass guidelines, environmental and social planning, communication and marketing, legislation, service provision, regulation, and fiscal measures. Considering the characteristics of the intervention and its framework for a pilot randomised controlled trial, it was concluded that the categories of environmental/social planning, regulation, fiscal measures, and legislation did not apply.

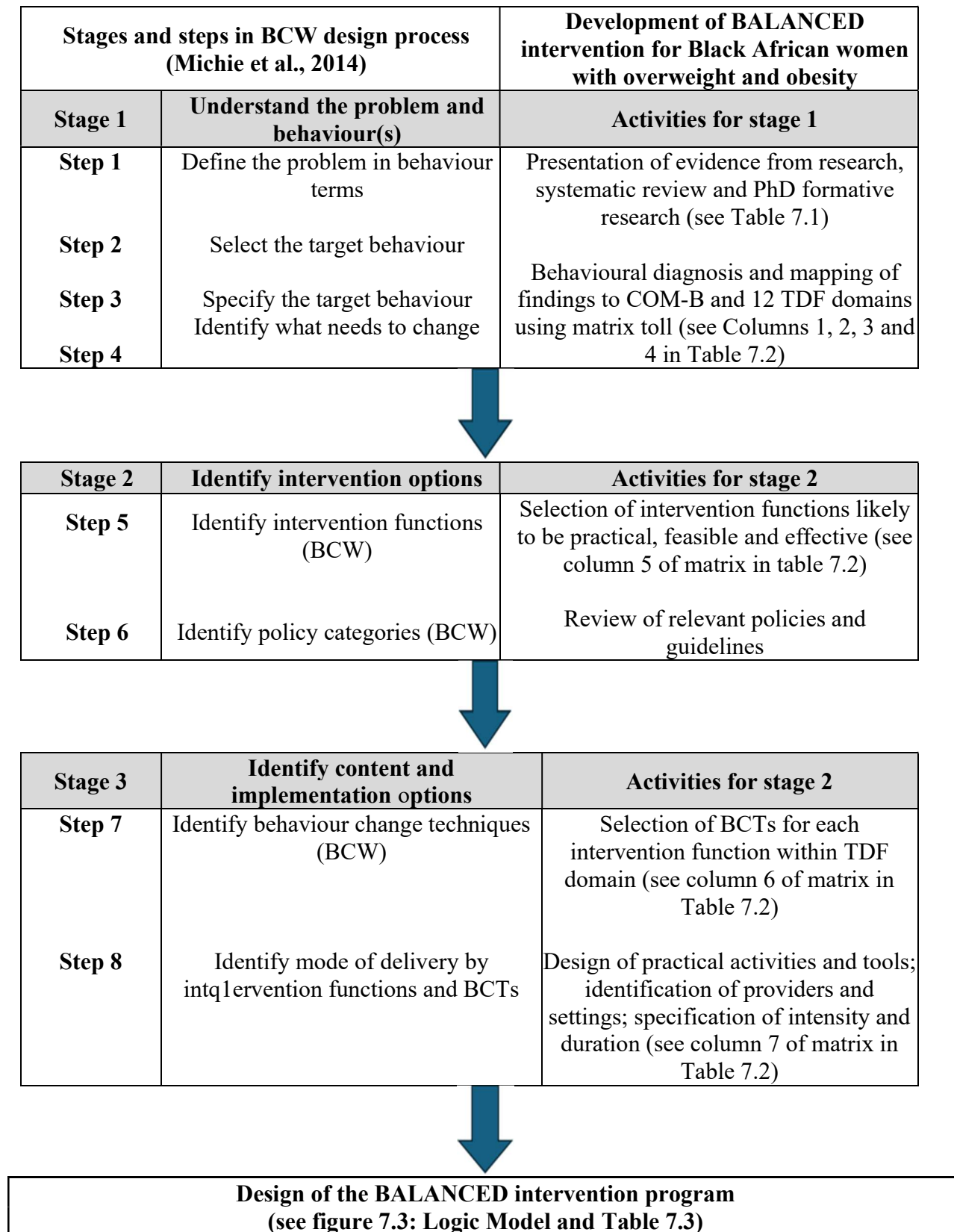
Stage 3: Identify Content and Implementation Options

In the third stage, the development of the intervention's content (Step 7) and the identification of suitable delivery modes (Step 8) were carefully guided by both evidence and practical considerations. The content design was informed by BCTs from Michie's (2014) taxonomy, a structured framework with clearly defined techniques that enabled precise selection and description of the intervention's core components. Findings from the systematic review (Study 1) also played a central role in shaping content, as they highlighted which BCTs were most effective for achieving the targeted behaviour changes within similar contexts. Drawing on these findings ensured that the content was both grounded in established research and strategically aligned with the intervention's objectives.

In Step 8, determining the most suitable modes of delivery involved evaluating options for feasibility, accessibility, and relevance to the specific setting. This decision-making process was informed not only by the systematic review's insights, which offered guidance on effective delivery practices, but also by feedback from participants during co-participatory in-depth interviews, whose preferences and needs were essential in refining the delivery approach. By integrating these findings, the intervention's delivery methods were designed to enhance participant engagement, address practical constraints, and ensure relevance to the target

population. This evidence-based, participant-centred approach to content and delivery development strengthened the intervention's potential effectiveness and sustainability.

Fig 7.2: Flow diagram for intervention design process



7.3 Results

7.3.1 Stage 1: Understand the Problem and the Behaviours

7.3.1.1 The Problem

A description of the various dimensions of the problem has been reported in Study 3 and 4 as well as findings from the follow up co-participatory in-depth interviews with these women (see Table 7.2). For the purposes of this chapter, the key findings and their implications for designing the intervention are summarised below.

The dietary intake and patterns assessment revealed critical shortcomings in the nutritional practices of Black African immigrant women in the UK. Most participants do not adhere to recommended dietary guidelines, particularly in their consumption of fruits and vegetables, leading to a reliance on energy-dense, nutrient-poor foods. This dietary trend is concerning, as it is associated with an increased risk of chronic diseases, highlighting an urgent need for effective intervention strategies that address the underlying causes of these unhealthy eating patterns.

In-depth interviews with women showed several systemic challenges impede these women's ability to access and maintain healthier dietary practices. Firstly, the limited availability and high cost of traditional African foods present significant barriers to healthy eating. The difficulty in sourcing culturally relevant ingredients in mainstream supermarkets exacerbates the reliance on processed foods, which are often more accessible and affordable. This lack of availability not only undermines cultural dietary practices but also contributes to nutritional inadequacy, as women are forced to substitute traditional foods with less healthy options. The research findings from the co-participatory research revealed the cultural insensitivity prevalent within existing nutrition services further complicates the situation. Standard dietary guidance provided in the

UK often fails to consider the nutritional value and preparation methods of African foods, leaving many women without adequate support to integrate their cultural practices into a healthy eating framework. This disconnect fosters feelings of alienation and discouragement, leading to disengagement from available nutritional resources.

Practical barriers also significantly influence dietary behaviours. Many Black African women encounter time constraints stemming from work and family responsibilities, which limits their ability to prepare healthy meals. Furthermore, the technological divide, marked by a lack of familiarity with digital tools for promoting healthy eating, exacerbates these challenges. Many women face challenges in leveraging available resources because of insufficient digital literacy, which restricts their access to vital nutrition information. Additionally, the healthcare system poses substantial barriers that impede efficient dietary management. Differences in language and cultural misunderstandings present considerable challenges in obtaining tailored nutritional guidance, while experiences of discrimination in healthcare settings foster mistrust and disengagement. This intensifies the already limited engagement with healthcare services, hindering women from accessing essential support for their dietary needs.

The accessibility of nutrition-related information is further limited due to underlying systemic issues in healthcare delivery. Many women report that resources on nutrition are predominantly accessible only during GP appointments, which may not be available to everyone. Additionally, popular weight management programs such as Weight Watchers and Slimming World fail to consider African dietary practices, which can alienate individuals looking for culturally relevant guidance (Liu et al., 2012; Maynard et al., 2023). The lack of inclusive programming, along with insufficient follow-up and support from healthcare providers, results in frustration and unmet needs in dietary management efforts. Ultimately, these women must navigate a complicated web

of barriers that impede their capacity to adopt healthy eating habits. Their efforts to achieve self-sufficiency in dietary health management highlight a notable deficiency in culturally sensitive support and person-centred strategies in existing services. The findings from stage phase underscore the urgent need for strategies that not only tackle the eating habits of Black African immigrant women but also engage with the multifaceted socio-cultural and systemic barriers that hinder their access to relevant nutrition information and resources.

7.3.1.2 The Behaviours

The intervention targeted the primary, modifiable risk behaviours associated with overweight and obesity, specifically diet and elements of physical activity. An in-depth analysis of these target behaviours, guided by Steps 3 and 4 of the BCW and using the COM-B model and TDF, is detailed in Table 7.2. Likewise, Table 7.2 presents a structured analysis of the 12 TDF domains, organised under the COM-B model categories: Capability, Opportunity, and Motivation. Column three captures findings from formative research conducted with Black African women with overweight and obesity, providing insight into the behavioural challenges they encounter within each TDF domain. These findings underscore the barriers these women face in attempting behaviour change. Column 4 identifies the necessary changes in both the women and their social and physical environments that could facilitate behaviour change, highlighting key targets for intervention.

7.3.2 Stage 2: Identify Intervention Functions

The BCW framework offers a set of nine intervention functions shown to be effective in facilitating behaviour change: education, persuasion, incentivisation, coercion, training, restriction, environmental restructuring, modelling, and enablement. For this intervention, seven

of these functions were selected as suitable approaches. The choice of intervention functions for each COM-B model component and corresponding TDF domain is outlined in Column 5 of Table 7.2. This selection demonstrates a strategic mapping of intervention functions to specific behavioural influences. In several cases, multiple intervention strategies were found to be applicable to a single domain, indicating the complexity and multi-faceted nature of the behavioural targets addressed.

7.3.3 Stage 3: Identify Content and Implementation Options

Column 6 in Table 7.2 identifies the BCTs selected for each intervention function within specific TDF domains. In turn, Column 7 details the practical activities, tools, and resources through which these BCTs and intervention functions can be feasibly implemented, including specifications for intervention intensity and duration. For instance, the intervention functions of Enablement, Education, and Persuasion—alongside their associated BCTs, such as social support, verbal persuasion regarding capability, reframing, and behavioural demonstration—were designed to be delivered through structured education and counselling activities. These included counsellor-led sessions, peer support groups, and the integration of real-life testimonials in the health education modules and leaflets, showcasing individuals in similar circumstances overcoming common obstacles.

Overall, table 7.2 presents a detailed overview of the systematic approach employed to tailor the intervention according to the unique needs of the target population. This process began with a comprehensive behavioural analysis of formative research findings on Black African women with overweight and obesity (Column 2), employing the COM-B model and TDF to delineate key behavioural influences (Columns 1 and 2). Subsequently, the intervention development

involved a series of steps, including a behavioural diagnosis aimed at identifying the essential actions required for behaviour modification (Column 4). This was followed by the identification of relevant intervention functions and strategies designed to address the recognised barriers and facilitate change (Columns 5 and 6). Finally, the selected intervention activities, tools, and resources underwent evaluation for feasibility and acceptability based on in depth interviews with the women and inputs from practitioners, confirming their alignment with the intervention's objectives (Column 7).

The resulting matrices serve as a structured guide, combining essential intervention elements for primary target behaviours—diet and physical activity. These comprehensive "maps" facilitate decisions on the active components and the intervention's overall scope within resource constraints, ensuring an effective and well-targeted approach to supporting behaviour change.

Table 7.2 BALANCED Matrix: COM-B: TDF domains, theoretical constructs and relevance Black women with overweight and obesity

Sub-Table 7.2a: CAPABILITY

TDF Domain	Formative assessment	For behaviour change to occur, Black African women would with overweight and obesity need to:	Intervention Function: What needs to be done to change behaviour	Behaviour change techniques (BCTs)	Resources, tools, activities/delivery
Psychological Capability					
Knowledge Evidence Sources: - Study 4 (interviews) - In-depth interviews on program practicality	• Foundational understanding of healthy eating • Concerns on health diets for children • Low awareness of nutrition-related information available at GP centres • Concerns about absence of person-centred approaches to weight-related issues. • Unawareness of where to seek help for weight-related problems. • Lack of culturally appropriate nutrition info from general UK nutrition services including healthy eating guide. • Challenges using digital resources for nutrition	Increase knowledge of: • Overweight and obesity and associated chronic conditions, potential for prevention through lifestyle changes • What constitutes a healthy diet for self and children • Role of portion control • How to sustain a healthy diet under pressure and hard environmental pressures	Education: • About obesity related health risks • Define a healthy diet that is culturally relevant for themselves and their families • Incorporate portion control tips into meal planning resources and guidebooks that resonate with the cultural context	5.1 Information about health consequences	• Module on Diet • Leaflet on obesity • Individual or group counselling, peer support, including accountability partners and peer group discussion • Visual aids for raising awareness of sugar, fat, salt content etc.

	information due to unfamiliarity with technology				
Cognitive Skills Evidence Sources: - Study 4 (interviews) - In-depth interviews on program practicality	• Lack skills in purchasing healthy foods • Unfamiliar with portion control techniques • Desire for cooking classes that respect and incorporate African culinary practices. • Limited skills in negotiating or challenging social and family norms	Acquire skills: • Learning to select nutritious, affordable foods and read labels effectively. • Mastering portion sizing techniques and understanding balanced servings. • Preparing healthier versions of traditional African dishes. • Setting dietary boundaries and communicating choices respectfully in family and social settings.	Training: • Workshops on purchasing healthy foods with budgeting and label-reading skills • Portion control demonstrations with visual aids; culturally relevant cooking classes for healthier traditional dishes • Role-play exercises to build confidence in setting dietary boundaries and navigating social pressures.	4.1 Instruction how to perform Behaviour 15.2 Mental rehearsal of successful performance	• Diet module (food label graphics and portioned plate graphics) • Recipe book • Peer group workshop • Activity: role-play, problem solving strategies for negotiating change • Meal planning tips
Memory, Attention, decision, Processes Evidence Sources: - In-depth interviews on program practicality	• Need strategies to reinforce dietary knowledge and facilitate healthier food choices in real-life situations. • Need tools to enhance focus and support quick, informed decision-making regarding food selections.	• Pay more attention to dietary knowledge and apply it consistently in daily food choices. • Utilize decision-making tools to quickly assess and choose healthier food options in various situations.	Training: • Identify opportunities for participants to practice applying dietary knowledge in various settings such as restaurants, supermarkets, workplaces, and home environment. • Reflection Sessions: facilitate periodic group meetings for participants to share experiences, reflect on	6.1 Demonstration of the Behaviour 2.2 Feedback on behaviour 3.2 Social support 8.2 Behaviour substitution	• Module on Diet • Recipe cards and guides featuring healthy, culturally relevant dishes that emphasize nutritious ingredient substitutions. • Access to mobile apps and food diary templates that facilitate tracking dietary choices and assessing nutritional value.

			their dietary choices, and discuss challenges. • Training on using tools such as food diaries, apps, or decision matrices to evaluate food options quickly. • Providing structured opportunities for participants to receive feedback on their decision-making processes and food choices from peers and counsellors		• Personal notebooks for participants to document their thoughts, dietary choices, and reflections on their eating habits. • Simulated environments where participants practice making food choices in various settings (e.g., eating out, family gatherings) to enhance decision-making skills.
Behavioural regulation Evidence Sources: - Study 1 (Systematic Review)	• Need for self-monitoring tools for dietary change and weight	• Need to consistently track their dietary intake and weight to identify patterns and areas for improvement. • Establish personal goals for dietary changes and weight management that are realistic and achievable.	Enablement: • Provide accessible tools such as food diaries, apps, or online platforms to facilitate easy tracking of dietary intake and weight. • Provide counselling to help women set achievable goals and reflect on their progress	2.3 Self-monitoring of behaviour 2.4 Self-monitoring of outcomes (Method to record outcome) 2.1 Feedback on behaviour 1.1 Goal setting (behaviour) 1.5 Review of behaviour	• Printable or digital templates that can be used to log daily food intake and exercise. • Wearable devices that track physical activity and provide feedback on health metrics. • Counselling Sessions: Regular one-on-one or group sessions to assist in setting achievable goals and reflecting on their progress.

				goals (jointly with counsellor)	• Weighing scales available at counselling sessions
Physiological Capability					
Physical Skills Evidence Sources: - In-depth interviews on program practicality	• Lack adequate cooking skills for healthy foods	• Acquire the physical skills to prepare foods using healthier ingredients and methods	Training: • Provide guidelines and recipes Modelling: • Provide hands-on classes focused on healthy African recipes. • Practice healthy techniques at home to gain confidence in preparing nutritious meals.	4.1 Instruction on how to perform behaviour 6.1 Demo of behaviour	• Culturally relevant cookbooks featuring healthy African recipes with nutritional information. • Cooking Demonstrations: Live or recorded sessions showcasing healthy cooking techniques and ingredient substitutions.

Sub-Table 7.2b: OPPORTUNITY

TDF Domain	Formative assessment	For behaviour change to occur, Black African women would with overweight and obesity need to:	Intervention Function: What needs to be done to change behaviour	Behaviour change techniques (BCTs)	Resources, tools, activities/delivery
Physical Environmental Context and resources Evidence Sources: - Study 4 (interviews)	• Adaptation to new food environments • Exploration of British cuisines • Time is perceived as a barrier • High cost of African foods, and limited availability • reduced feeling of satisfaction (fullness) from British foods • high exposure to unhealthy choices and relatively little exposure to healthy eating messages	• Learn and practice how to prepare healthy recipes quickly and efficiently • Learn how to eat healthily on a budget by reallocating money spent on take-away • Have critical understanding of the obesogenic environment • Have access to information and resources that promote healthy eating	Training: • Strategies to eat healthily on a budget Enablement: • Increase critical awareness of ads marketing unhealthy foods • Provide resources and information that can serve as cues/reminders for healthy choices	6.1 Demonstration of the behaviour 4.1 Instruction on how to perform the behaviour 13.2 Reframing 12.5 Adding objects to environment	• Budget-Friendly Recipe featuring healthy, affordable recipes with tips on cooking African-inspired meals quickly. • Visual Cues/Reminders: Posters, fridge magnets, or app notifications with healthy eating reminders and tips for resisting marketing of unhealthy foods. • Practical cooking sessions where participants learn time-saving techniques and meal-prep strategies for healthy eating. • Training on allocating food budgets effectively, with

					practical exercises on choosing healthy yet affordable ingredients.
Social Influence Evidence Sources: - Study 4 (interviews)	- Children as motors of change at home, - Lack of help - Partners' limited involvement	- Leverage children's influence by involving them in healthy eating and lifestyle practices - Seek additional support networks outside the family - Encourage partner engagement by promoting shared goals and activities	Modelling: - Encourage family members, especially children and partners, to adopt healthy behaviours, making healthy choices more routine at home. Enablement: - Family and friend invited to peer group and counselling sessions Environmental Restructuring: - Organise family-centred health activities to engage partners and children, building collective commitment to healthier lifestyles.	3.2 Social support (practical) 3.3 Social support (emotional) 6.1 Demonstration of the Behaviour 1.4 Action Planning	- Peer group and home visits establish continuity of care - Group sharing of recipes, cooking methods can promote - Feelings of social support - Choose recipes for a week. Everyone gives feedback on experience

Sub-Table 7.2c: MOTIVATION

TDF Domain	Formative assessment	For behaviour change to occur, Black African women would with overweight and obesity need to:	Intervention Function: What needs to be done to change behaviour	Behaviour change techniques (BCTs)	Resources, tools, activities/delivery
Motivation (reflective)					
Beliefs about Consequences Evidence Sources: - Study 1 (Systematic review) - Study 4 (interviews)	- Believe consequences of obesity related to chronic conditions - Underestimation of personal dietary risk and associated chronic illnesses - Negative beliefs about healthy foods (food is tasteless or that health eating will leave them hungry)	- Make clear link between behaviour and health outcomes - Believe in benefits of healthy diet for self and family - Believe healthy eating can be sustainable, palatable and affordable	Education: - Provide information on risk of obesity Persuasion: - Reframe what obesity signifies for self and family Modelling: - Provide strategies to deal with potentially negative consequences of eating healthily	5.1 Information about health consequences 13.2 Reframing 6.1 Demonstration of the behaviour 8.1 Behaviour practice/rehearsal	- Module on the health risks of obesity and benefits of a healthy diet - Visual aids that clearly link specific dietary behaviours with health outcomes - Food quiz in module to assess diet of self and family - Address beliefs/attitudes about healthy eating - Cooking demo with emphasis on attractive presentation
Intentions	Lack of childcare support as a barrier to	Need access to affordable or onsite childcare options to	Environmental Restructuring:	3.1 Social Support (Practical)	Assessing readiness to

Evidence Sources: - Follow up In-depth interviews on program practicality	participate in intervention programs Time as a valuable resource	participate in health interventions Need flexible, time-efficient program structures that fit within their schedules	- Offer onsite or subsidised childcare during sessions to remove childcare as a barrier to participation. Enablement: - Provide flexible scheduling options (e.g., evening/weekend sessions) to fit interventions into busy routines. Persuasion: - Highlight the long-term health benefits and time-saving aspects of participation, encouraging prioritisation of self-care.	12.5 Adding Objects to the Environment 1.4 Action Planning 9.3 comparative imagining of future outcomes 7.1 Prompts/Cues 9.2 Pros and Cons	- change. (use 1–10 Motivational Interviewing scale in individual counselling) - Childcare Facilities - Flexible program delivery, use of online delivery - Shorter program durations with concise, actionable content would help maintain interest and engagement.
Beliefs about capabilities Evidence Sources: - Study 4 (interviews)	- Women feel insufficient sense of agency about food choices - Not confident about ability to meet lifestyle goals	- Believe they are capable of change despite constraints - Feel able to make healthier choices for themselves and family (greater agency and locus of control)	Persuasion: - To enhance self-efficacy and self-monitoring Enablement: - Assist problem solving to address overcoming context specific barriers	3.2 Social support (practical) 6.1 Modelling 1.2 Problem solving 15.3 Focus on past success	- Motivation interviewing (individualized) to enhance self-esteem, confidence and self-autonomy - Peer group sessions on

		Believe that healthier eating can be a sustainable lifestyle	Facilitate activities that promote self-efficacy		overcoming barriers
Motivation (automatic)					
Reinforcement Evidence Sources: - Follow up In-depth interviews on program practicality	- Interventionists from the target population - Cultural beliefs about body size - Financial Incentives	- Need for role models and interventionists who understand and share their cultural background - Need support in reconciling cultural beliefs about body size with health-focused goals - Need motivational support, such as financial incentives, to reduce perceived barriers and encourage engagement	Modelling: - Use interventionists from the target population who can provide relatable examples and inspire participants through shared experiences. Incentivisation: - Offer financial incentives, such as vouchers or discounts, to motivate regular participation and increase commitment. Persuasion: - Frame healthy body size and weight loss in terms that align with cultural values, emphasizing well-being over appearance to foster intrinsic motivation.	6.1 Demonstration of the Behaviour 10.1 Material Incentive (Behaviour) 13.2 Framing/Reframing 5.3 Information about Social and Environmental Consequences	- Train health coaches Train interventionists from the target community - Budget for gift cards, vouchers, or discounts for consistent participation - Culturally tailored educational materials focusing on well-being and family health rather than appearance. - Testimonial Videos
Emotion Evidence Sources: Study 4 (interviews)	Experience of negative reactions to traditional foods	Need tools and support to manage stress and emotional triggers that lead to	Training: Provide techniques to help manage stress and emotional triggers. Persuasion:	3.3 Social support (emotional) 15.2 Identity Support: Cultural	Educational materials on stress management strategies.

	Feelings of stress can result in unhealthy eating patterns	unhealthy eating patterns. Need encouragement to maintain pride and confidence in their cultural dietary practices	Reinforce pride in cultural heritage and dietary practices through group discussions, supportive messaging Education: Reframe the narrative around traditional foods to emphasize their cultural and nutritional value	Identity Workshops 14.1 Emotion Regulation: Cognitive Reappraisal 14.2 Emotion Regulation: Mindfulness 13.2 Persuasion: Reframing	- Stress management assessment tools (like the Perceived Stress Scale). - Peer-support - Training counsellors to be aware of emotionally charged language related to diet and weight.

7.4 Overview of Proposed BALANCED Intervention

The logic model in Figure 7.3 and Table 7.3 provides a structured overview of the BALANCED intervention prototype, outlining its core inputs, activities, mechanisms of change, and expected outcomes. This intervention is directed toward both Black African women with overweight and obesity, while being delivered by healthcare counsellors supporting them. These counsellors may include trained psychologists, clinicians, or members of the local community. Community members, valued for their close understanding of local language, customs, and cultural values, may either deliver the intervention or work in partnership with healthcare professionals to enhance culturally relevant support.

The intervention plan assigns counsellors the responsibility of educating, training, counselling, and offering social support to women with overweight and obesity in various settings, including hospitals and the community. Their responsibilities encompass the organisation of peer support groups, the facilitation of community-based sessions, and, upon request, the conduct of home visits to deliver personalised support. Healthcare professionals and lay counsellors receive training focused on a client-centred, motivational approach to behaviour change counselling, which integrates principles from Motivational Interviewing (Miller & Rollnick, 2014) and the Healthy Conversations approach (Hollis et al., 2021).

As shown in Study 1 of Chapter 3, client-centred counselling differs from traditional directive approaches, which frequently depend on prescriptive advice. This intervention reframes the role of the counsellor as a facilitator, guiding clients in exploring behaviour change by enabling them to articulate their own motivations and address ambivalence regarding lifestyle modifications. This approach fundamentally emphasises empathy and active listening, enabling counsellors to

fully understand each client's perspective while respecting their autonomy in decision-making (Miller & Rollnick, 2012). The co-participatory qualitative study with the target population revealed significant dissatisfaction with traditional approaches that dictate behaviour change without considering individual concerns. The women expressed a preference for an educational and counselling approach that fosters collaboration and actively involves them as participants. This approach enables individuals to ask questions, articulate emotions, and receive support in implementing lifestyle modifications that are realistic within their unique personal and cultural contexts. Peer group sessions aim to enhance social support and provide opportunities for problem-solving, skills development, and peer modelling (Murphy et al., 2023). To support counsellors in ensuring consistency and effectiveness, case records will be utilised to maintain comprehensive documentation, facilitating process evaluation and offering a structured approach for each session. Regular group feedback meetings will be scheduled, providing an opportunity for counsellors to share experiences, address challenges, and exchange insights. Continuous coaching and role-play practice sessions for counsellors (as suggested by DiLillo & West, 2011 and Herring et al., 2016) are recommended, during the initial months of the intervention to strengthen the motivational counselling techniques introduced in the initial training. This ongoing support seeks to enhance the skills of counsellors, foster confidence, and ensure that the goals and objectives of the intervention are delivered with both sensitivity and effectiveness.

Fig. 7.3: Logic model for the BALANCED intervention

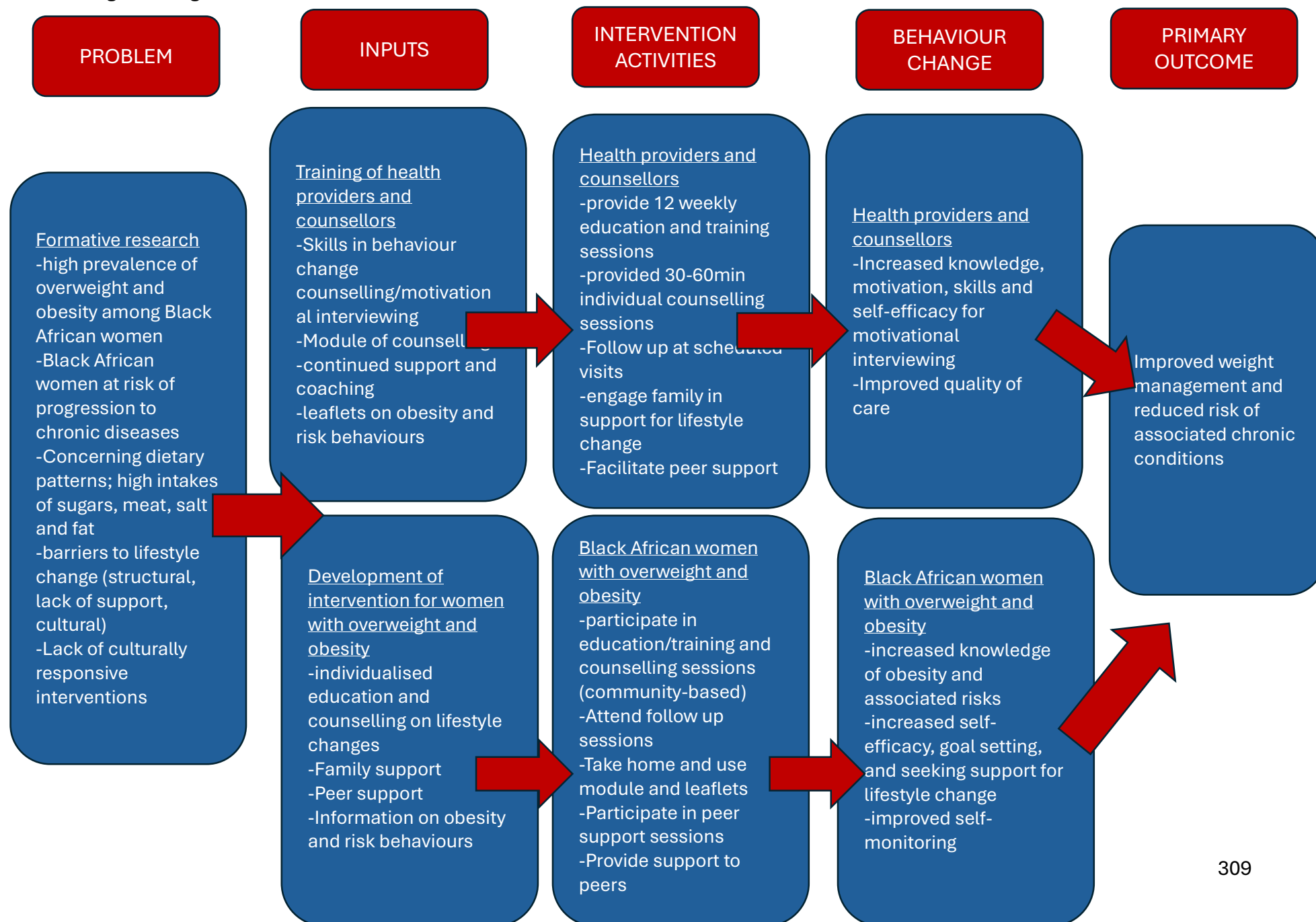


Table 7.3 Components of The Balanced Intervention

Key intervention features			Evidence Base
Nutritional Education:	Week 1	Focused on health risks related to overweight and obesity and specific to this demographic	Study 1 (Systematic review) Practitioners' webinar
		Framing healthy body size and weight loss in terms that align with cultural values, emphasizing well-being over appearance to foster intrinsic motivation	
Training:	Week 2	Shopping: Budgeting and label-reading	Study 1 (Systematic review)
	Week 3	Cooking classes: Adjust Ethnic recipes- low-fat techniques/recipes	Study 3 (dietary pattern assessment) Study 4 (Interviews)
	Week 4	portion control demonstrations	Follow up In-depth interviews on program practicality
	Week 5	Sampling of new foods and recipes swap	Practitioners' webinar
	Week 6	Cooking classes: Adjust Ethnic recipes- low salt techniques/recipes	
	Week 7	Cooking classes: Go for grains, fruits and vegetables	
	Week 8	Meal planning: review of menus	
	Week 9	Role-play: Confidence-building for setting dietary boundaries and navigating social pressures: eating out/social eating	
	Week 10	Stress management	
	Week 11 and 12	Exercise options	
Behavioural Counselling:	Bi-weekly individual sessions addressing psychological and emotional barriers to weight loss.		Study 1 (Systematic review)
Family-Inclusive Support:	Workshops engaging family members to create supportive environments for participants.		Follow up In-depth interviews on program practicality
Peer support/accountability partners			Follow up In-depth interviews on program practicality

7.5 Webinar Component: Expert Feedback on Feasibility and Practicality of the BALANCED intervention

7.5.1 Introduction

As part of the iterative development process for the BALANCED intervention, a webinar was conducted on the 20th of January 2025, to evaluate the feasibility, cultural relevance, and practicality of the proposed program. This step served to validate the intervention's components and refine its design based on expert insights, ensuring alignment with the needs and expectations of the target population—Black African women aged 18–65 years in the UK with overweight and obesity. The webinar built upon the evidence and data gathered from preceding studies in this PhD program and provided a platform for constructive feedback from practitioners with relevant expertise.

This step was critical to addressing potential implementation challenges, as well as ensuring the intervention's acceptability and sustainability. It aligns with the broader aim of this PhD program to develop an evidence-informed, culturally tailored, and theory-driven intervention that can be effectively implemented within community and healthcare settings.

7.5.2 Aims and objectives of the webinar

The primary goal of the webinar was to assess the intervention's feasibility for implementation and its potential to address the unique barriers faced by Black African women in the UK with overweight or obesity. The feedback from this session informed refinements to the intervention, particularly in terms of addressing challenges related to cultural sensitivities, motivation, and practicality of delivery.

The webinar aimed to achieve the following objectives:

1. To solicit expert feedback on the intervention's feasibility, practicality, and cultural relevance.

2. To identify any potential barriers to implementation and strategies to address them.

7.4.3 Methodology

7.4.3.1 Study population

The study aimed to recruit approximately 7-12 practitioners, including psychologists, counsellors, nutritionists, dietitians, GPs and health commissioners in the UK. This sample size is appropriate for a qualitative feasibility study (Baker et al., 2012), ensuring a range of professional perspectives while allowing for in-depth feedback. Given the exploratory nature of this research, this number provides a sufficient range of insights without being unmanageable for detailed qualitative analysis.

7.4.3.1.1 Inclusion Criteria

To be eligible to participate in the webinar, participants were required to be qualified practitioners working in the fields of psychology, counselling, nutrition, dietetics, or professionals working in public health within the UK. They also needed to have a minimum six months of experience working with diverse populations including Black African populations, particularly in health and social care settings or involved in health promotion and be fluent in English to engage effectively in the webinar.

7.4.3.1.2 Exclusion Criteria

Practitioners who lacked direct experience in healthcare or health promotion, or those who were not currently practicing within the UK.

7.4.3.2 Recruitment and Selection

Participants were recruited through convenience sampling, primarily by reaching out to professional networks, local health organisations, and relevant associations. Invitations were sent via email and shared on professional social media platforms including LinkedIn, ensuring broader outreach to practitioners with relevant expertise (see Appendix 19). This approach ensured accessibility to practitioners with relevant expertise and experience. Individuals who indicated interest in

participating were sent the PIS and consent forms. Only those who provided informed consent, and met the eligibility, criteria received access to the webinar link and the survey link.

Participants received a £20 voucher as a token of appreciation for their time and valuable contributions. This incentive was not intended to pressure or coerce participation but to acknowledge their professional input. Participation remained entirely voluntary, and the vouchers were provided regardless of the nature of the feedback given. This ensured that participants felt appreciated while maintaining the integrity and objectivity of their responses.

7.4.3.3 The Webinar

The webinar was structured to ensure comprehensive engagement and feedback from participants regarding the BALANCED intervention. It began with an in-depth presentation that outlined the intervention's key components and theoretical underpinnings, including its foundation in the COM-B model and BCW. The presentation also highlighted the intervention's focus on client-centred counselling, culturally tailored nutritional education, and behaviour change techniques, setting the stage for informed discussion (see Appendix 20). Following this, a group discussion provided an opportunity for practitioners to share verbal feedback on the intervention's design and implementation. This segment encouraged participants to reflect on the feasibility, practicality, and cultural relevance of the intervention, drawing on their professional experience. To further capture detailed and structured feedback, a brief questionnaire was administered (see Appendix 19). The survey focused on eliciting insights into specific aspects of the intervention, such as its potential challenges, suitability for the target population, and practicality in real-world settings. This multi-faceted approach allowed for both qualitative and quantitative feedback, contributing to a richer understanding of the intervention's applicability and areas for refinement.

7.4.3.4 Ethical Approval

Ethical approval for this research was obtained from the St Mary's University Research Ethics Committee; SMU_ETHICS_2024-25_861 (see Appendix 14). All procedures were in accordance with regulations and guidelines approved by the ethics committee.

7.4.4 Results

7.4.4.1 Study participants

The webinar engaged a panel of 13 experts; each selected for their expertise in areas relevant to the intervention. Table 7.4 provides details of the participant's characteristics.

Table 7.4 Characteristics of participants (n=13)

Characteristic	Details
Professional Background	GP (n = 3), Public Health Specialist/Practitioner (n = 4), Consultant in Public Health (n = 1), Nutritionist (n = 1), Dietitian (n = 1), Pharmacist specialising in public health (n = 2), Public Health Trainee (n = 1)
Years of Experience	Ranged from 3 to 22 years, with most (77%) participants having over 15 years of professional experience.
Work Settings	NHS, Local Authorities, Community Health Organisations, and Private Practice
Service Areas	Southeast London, Kent, Bromley, West Sussex, Middlesbrough
Ethnicity	Predominantly Black African participants (n = 12), White British (n = 1).
Experience with Target Population	Direct experience working with the target population (n = 12), indirect experience (n = 1)

7.4.4.2 Feedback Summary

7.4.4.2.1 Feasibility and practicality of the Intervention

The feasibility and practicality of implementing the BALANCED intervention in real-world settings, such as NHS services or community health programs, were viewed positively by practitioners, who highlighted both opportunities and challenges. The intervention was regarded as a feasible and promising starting point, even if not all issues could be fully addressed at the outset. They suggested linking the program with existing cultural events or community programs to enhance its relevance

and integration. However, challenges were identified, including the need for more individualised solutions to address cultural factors, such as body image and societal norms, and strategies to maintain participants' motivation throughout the intervention. Cost-effectiveness was also emphasised as a critical factor for scaling the program to larger populations, particularly in resource-constrained settings. Retention rates were flagged as a potential concern, with experts recommending strategies to enhance engagement and minimise dropouts such as the provision of peer support groups and follow-up sessions that were individualised (Borek et al., 2018; Befort et al., 2008).

The practicality of the delivery format was also well received. Practitioners noted that the program's structure, which included modules on education and training, peer support, and family workshops, was appropriate and adaptable for the target population. However, some participants might exhibit a preference for specific sections of the program, which could influence their engagement. To address this, practitioners recommended conducting risk assessments and implementing mitigating strategies to ensure that the intervention meets the diverse needs of its participants while maintaining overall effectiveness. These insights underscore the importance of balancing cultural sensitivity, participant engagement, and cost considerations in the design and delivery of the BALANCED intervention.

7.4.4.2.2 Cultural Relevance

The cultural appropriateness of the BALANCED intervention was positively acknowledged, with experts affirming its alignment with the values and needs of the target population. However, critical feedback highlighted areas for improvement to enhance its cultural relevance and practicality.

Practitioners emphasised the need to address cost barriers associated with healthy eating, which could pose significant challenges for participants in adopting healthier dietary practices. Additionally, the practicality of preparing culturally appropriate yet healthy meals was underscored as an essential consideration to ensure sustained engagement. While the intervention was deemed relevant, experts recommended placing greater emphasis on body image, given its cultural significance within this

population, and promoting alternative healthy food options that align with cultural preferences. These insights highlight the importance of refining the intervention to address economic and practical challenges while maintaining its cultural sensitivity and resonance.

7.4.4.2.3 Recommendations and implications for Improving the BALANCED program

This qualitative feedback from the webinar provided critical insights that informed key refinements to the BALANCED intervention, ensuring its relevance, feasibility, and cultural sensitivity for Black African women in the UK. One of the primary adjustments was the inclusion of low-cost, healthy meal options accompanied by practical tips for preparing culturally appropriate meals within budget constraints. This directly addressed concerns about financial barriers to healthy eating. Additionally, retention strategies were strengthened by incorporating peer support groups and individualised follow-up sessions to sustain participant motivation and reduce dropout rates. Linking the intervention to existing community programs and events was also identified as a means to enhance feasibility and engagement.

Further recommendations focused on improving participant engagement and tailoring the intervention to better meet their needs. Suggestions included providing incentives such as food and gym vouchers to sustain motivation and involving interventionists from within the demographic to address language and cultural barriers effectively. Continuous co-production and co-planning with participants were highlighted as essential for fostering trust and ensuring the intervention aligns with the lived experiences of the target population.

Delivery methods were also refined to improve accessibility, particularly for women with lower socioeconomic status or limited literacy. The inclusion of mobile phone-based sessions alongside online counselling was proposed as a practical solution to reach this demographic effectively. Moreover, capturing regular feedback throughout the program was recommended as a mechanism to

identify and resolve emerging issues in real-time, ensuring the program's responsiveness and adaptability.

Recruitment strategies were another critical area addressed. Experts suggested leveraging religious organisations and community-based networks that already work with the demographic to ensure broad outreach and build trust. Finally, high dropout rates were acknowledged as a significant challenge, prompting recommendations for tailoring the intervention to individual preferences and offering ongoing support mechanisms to promote sustained participation. These combined implications and recommendations reflect a comprehensive approach to refining the BALANCED intervention, ensuring its effectiveness, cultural relevance, and feasibility in addressing overweight and obesity among Black African women in the UK.

7.6 Discussion

The proposed BALANCED intervention, which was designed through an application of the BCW and the COM-B model, and informed by the thesis findings represents an innovative step in addressing overweight and obesity among Black African women in the UK. To the best of the author's knowledge, this is one of the first studies to describe the use of BCW in the development of an intervention specifically for Black African women with overweight and obesity in the UK. This culturally tailored, evidence-based program fills an important gap by addressing the complex, multidimensional barriers faced by this population, providing a theoretically robust and contextually relevant framework for behaviour change. Through a rigorous, participatory approach, the intervention demonstrates the potential of culturally sensitive public health strategies to reduce health disparities and promote sustainable lifestyle changes.

The BALANCED intervention was developed following the UK MRC framework for complex interventions (Craig et al., 2013), which highlights a systematically phased approach that includes

stages of development, pilot testing, evaluation, and implementation. This structured approach ensured that the intervention was grounded in evidence and suited to the context, in accordance with best practices in the design of behavioural interventions. Central to this approach was the application of the BCW and COM-B model, offering a thorough and systematic framework for identifying target behaviours and designing tailored programs.

The COM-B model identifies Capability, Opportunity, and Motivation as core components influencing behaviour. It played an instrumental role in diagnosing barriers and facilitators to healthy eating among Black African women. The formative research within this thesis, including cross-sectional studies and in-depth qualitative interviews, revealed deficits across all three domains.

Psychological and physical capability was limited by the target population's lack of culturally relevant nutritional knowledge and cooking skills, reflecting broader trends in marginalised groups where mainstream dietary guidelines often lack cultural relevance. This aligns with research emphasising the need for culturally tailored educational interventions to bridge knowledge gaps and foster behaviour change (Joo & Liu, 2021). In response, the BALANCED intervention included educational modules and culturally sensitive cooking workshops to improve participants' knowledge and skills in preparing healthier versions of traditional African dishes, addressing both theoretical and practical aspects of capability.

Opportunity, encompassing physical and social dimensions, also emerged as a significant factor. Limited availability and high costs of traditional African foods, alongside time constraints from work and family responsibilities, posed substantial barriers to healthy eating. The lack of culturally sensitive support in mainstream healthcare services compounded these challenges, underscoring the need to improve social opportunities. These findings align with literature highlighting the role of environmental and social factors in health behaviour change (Michie et al., 2011). The BALANCED intervention addressed these barriers through environmental restructuring and enablement,

incorporating practical tools for meal planning, peer support systems, inclusive family support and community-based workshops to cultivate a supportive environment that reinforced positive behaviours also focussing on strategies to navigate an obesogenic environment such as eating healthily on a budget, managing time constraints and adapting to local food availability.

Motivation, both reflective and automatic, played a pivotal role in shaping dietary behaviours. The qualitative studies highlighted the importance of culturally relevant, client-centred counselling in enhancing motivation. As previously highlighted, many participants expressed dissatisfaction with conventional, directive dietary counselling approaches that failed to consider their cultural context and individual needs. The BALANCED intervention addresses this gap through motivational interviewing and peer support, fostering a collaborative and empowering approach. This aligns with evidence showing that empathetic, client-centred interventions are more effective in promoting behaviour change (Miller & Rollnick, 2012). Additionally, it includes reshaping beliefs about healthy eating, emphasises its affordability, taste and benefits for chronic disease prevention. Automatic motivation is also reinforced through the use of culturally relevant interventionist and role models that are crucial in fostering engagement and reconciliation of cultural beliefs about body size.

The BALANCED intervention's application of the BCW and COM-B model is consistent with other successful behaviour change programs aimed at dietary and physical activity behaviours (Handley et al., 2015; Murphy et al., 2023; Power et al., 2024; Smith et al., 2022). An analysis comparing similar interventions shows both shared principles and distinct contributions, emphasising the innovative features of the intervention and identifying areas that could benefit from further refinement. To illustrate, a recent study conducted in the UK by Power et al. (2024) utilised the BCW to create a home-based exercise program aimed at adults with overweight and obesity. This intervention was developed using secondary research, integrating findings from existing literature and qualitative insights gathered from previous interviews with the target group. In a manner similar to the

BALANCED intervention, Power et al. (2024) identified key barriers and facilitators by employing the COM-B model, focussing on psychological capability, opportunity, and motivation through tailored strategies. Both studies illustrate the adaptability of the BCW framework in designing interventions that are contextually relevant and address intricate behavioural factors. While Power et al. (2024) focused mainly on home-based physical activity, the BALANCED intervention broadens this perspective by incorporating culturally specific dietary behaviours, highlighting the necessity of a holistic, multi-faceted approach to tackle obesity in marginalised populations. Furthermore, interventions aimed at women with gestational diabetes mellitus (GDM) have shown the effectiveness of culturally sensitive, theory-driven strategies. The STAR MAMA (Support via Telephone Advice and Resources/Sistema Telefónico de Apoyo y Recursos-MAMA) project (Handley et al., 2016) focused on preventing Type 2 Diabetes in Latino women with GDM, demonstrating the importance of the BCW in organising a comprehensive planning process and developing interventions to meet particular cultural contexts. Similar to the BALANCED intervention, the STAR MAMA project highlighted the significance of considering cultural and contextual elements, utilising the COM-B model to identify barriers and facilitators to behaviour change. Both interventions demonstrate the importance of engaging target populations in the design process to achieve cultural relevance and acceptability.

The Stay-Active project developed a smartphone app aimed at increasing physical activity among women with GDM attending NHS services. It also employed the COM-B model and TDF mapping focus group findings with specific barriers and enablers (Smith et al., 2022). This approach facilitated the design of specific interventions that addressed the unique challenges encountered by women with GDM, including time constraints and environmental challenges. Similar to the BALANCED intervention, the Stay-Active project underscored the significance of tackling multiple determinants of behaviour simultaneously, employing a combination of educational, motivational, and environmental approaches.

These comparative studies underscore the BCW's capacity to capture the complexity of health behaviours and translate theory into practice. However, they also highlight challenges, particularly the time-intensive nature of the BCW process and the need for interdisciplinary expertise. The development of the BALANCED intervention required extensive formative research over two years, reflecting the time and resource commitment reported in similar studies. While this thoroughness is essential for creating culturally relevant and effective interventions, it underscores the importance of strategic planning and resource allocation to ensure feasibility and sustainability.

A key strength of the BALANCED intervention lies in its participatory co-design approach, which ensured cultural relevance and acceptability. Black African women were involved in the earlier phases of the PhD research, including exploratory studies that informed the identification of the intervention's modality and key components. Insights from these initial studies were instrumental in shaping the intervention's structure and content. While the same women were not directly involved in drafting or reviewing the final version of the programme, their contributions through earlier participatory work significantly influenced its development. Thus, their perspectives were embedded throughout the design process, helping to foster relevance, acceptability, and a sense of indirect ownership. This approach aligns with best practices in behaviour change intervention design, which emphasise stakeholder involvement as crucial for enhancing feasibility and sustainability (Murphy et al., 2023). The co-design process also facilitated the identification of context-specific barriers and enablers, ensuring that the intervention was both theoretically grounded and practically relevant.

Nevertheless, the complexity and time commitment required by the BCW process present challenges. The iterative nature of the development process, while rigorous, can be resource-intensive and may limit stakeholder involvement at every stage. This limitation was also noted in GDM interventions, where researchers found it challenging to maintain consistent input from participants and stakeholders throughout the BCW process (Murphy et al., 2023). Future research should closely

monitor and document the resources required for each phase, which can inform cost-effective strategies for scaling up interventions. Additionally, the involvement of multidisciplinary teams in its development, including GPs, behavioural scientists, nutritionists and dietitians, public health practitioners and community representatives, is essential for ensuring that interventions are both theoretically robust and contextually relevant.

Despite its strengths, the COM-B model is not without limitations. Some scholars have criticised its omission of key motivational factors, such as the role of "wanting" in behaviour change. "Wanting" refers to the intrinsic desire to achieve a specific goal, which can play a crucial role in shaping behaviour (Abrutyn & Lizardo, 2024). Addressing this gap may require integrating additional theoretical frameworks, such as self-determination theory, which emphasises the importance of intrinsic motivation and autonomy in behaviour change (Abrutyn & Lizardo, 2024). Additionally, there is currently no standardised measure for assessing the predictive validity of COM-B-based interventions. Developing robust evaluation tools will be essential for advancing the field and ensuring that interventions are both effective and adaptable across different contexts.

7.6.1 Future Research and Feasibility Testing

Future research should focus on piloting and evaluating the effectiveness of the BALANCED intervention, including a detailed feasibility assessment to inform larger-scale implementation. This should involve evaluating key feasibility outcomes such as recruitment, retention, engagement, and acceptability of both the content and delivery methods (Eldridge et al., 2016). A process evaluation is also recommended to explore fidelity of implementation, contextual influences, and participant experiences, in line with the MRC guidance on evaluating complex interventions (Craig et al., 2013). In parallel, an economic analysis should be conducted to estimate delivery costs and assess potential cost-effectiveness compared to existing interventions. If the pilot demonstrates positive outcomes, a full-scale randomised controlled trial, followed by longitudinal studies, would be necessary to assess

the long term effects of the intervention on dietary behaviours and health outcomes. In addition, future research should explore the broader systemic and structural factors, such as social determinants of health and healthcare inequities that influence behaviour change among Black African women (Marmot et al., 2010). Addressing these layers will support the development of holistic, equitable public health strategies aimed at reducing disparities in obesity and chronic disease.

7.7 Conclusion

The BALANCED intervention exemplifies the potential of theoretically grounded, culturally tailored approach to address health disparities. By leveraging the BCW and COM-B model, this PhD program has developed a comprehensive intervention for promoting behaviour change among Black African women. The intervention's participatory, culturally sensitive design ensures that it is both relevant and acceptable to the target population, addressing the unique challenges they face. Future research should build on these findings, piloting it and evaluating its effectiveness as well as exploring innovative strategies for interventions and refining theoretical models to better capture the complexity of human behaviour. Through continued efforts, this work can contribute to the broader goal of reducing health inequalities and improving outcomes for marginalized populations such as the Black African population.

Chapter 8

Chapter 8

Synthesis, Conclusions and Recommendations

8.1 Introduction

The aim of this thesis was to develop a culturally sensitive, client-centred counselling intervention to improve dietary behaviours and facilitate weight management among Black African women with overweight and obese from Sub-Saharan Africa living in the United Kingdom. This chapter will present a summary of key findings including a discussion of the implications for overweight obesity management in this demographic, implications for practice and recommendations for further research.

8.2 Synthesis

This PhD program offers significant contributions to the fields of health promotion, dietary habits, and weight management, particularly concerning Black African women—a group that has often been underrepresented in health research and intervention initiatives. This PhD program is very innovative and novel, representing one of the first comprehensive attempts to systematically evaluate the effectiveness of client-centred counselling interventions for weight management in Black African women residing in high-income nations. Additionally, it provides new perspectives on the dietary patterns of this population, drawing from quantitative and qualitative approaches to provide a holistic understanding of the challenges and opportunities in enhancing health outcomes for this demographic.

The methodological novelties, including the modification of the EPIC FFQ to incorporate culturally relevant foods and the enhancement of the Intake24 platform for more inclusive dietary assessment, stand as key achievements. These tools were modified and enhanced, respectively not only to capture the dietary habits of Black African women but also to recognise the socio-cultural context of their food choices. The incorporation of insights from the qualitative study enriches this perspective,

emphasising the significance of cultural relevance in dietary assessments and interventions. The qualitative findings revealed that Black African women encounter barriers in accessing culturally familiar foods, which shapes their dietary patterns and highlights the importance of developing tools and interventions that account for these cultural nuances.

8.3 Effectiveness of Client-Centred Counselling Interventions

Study 1, a systematic review of client-centred counselling interventions for weight management in Black African women, found that 93% of interventions resulted in positive weight loss outcomes, and 75% achieved clinically meaningful weight loss. These findings underscore the effectiveness of personalised, culturally tailored interventions in addressing obesity in this population relative to non-tailored approaches. While previous reviews have predominantly focused on mixed ethnic groups, this study highlights the importance of examining separate ethnic groups to account for the unique intersection of cultural, socio-economic, and environmental factors that shape health outcomes. The key innovation in this study is the explicit focus on Black African women, providing a more nuanced understanding of how tailored interventions can address specific needs within this population.

The review highlighted the role of culturally adapted BCTs such as goal setting, self-monitoring, and community involvement, in facilitating successful weight management. A critical takeaway is the importance of tailoring interventions to respect cultural values and preferences, which increases engagement and adherence. Notably, this study fills a gap in existing research by exclusively focusing on this population, avoiding the risks of overgeneralization and providing evidence for interventions that are both culturally sensitive and adaptable to individual needs. The qualitative study in study 4 further supports this, indicating that the success of such interventions hinges on understanding the socio-cultural context in which the women operate. For example, the qualitative study highlighted the role of family dynamics, cultural food preferences, and economic constraint behaviours. Interventions that acknowledge these factors are more likely to achieve success. The

review's focus on culturally adapted behaviour change techniques, including goal setting, self-monitoring, and community involvement, resonates with the themes identified in the qualitative study, which emphasised the importance of social support in health behaviour change. These findings align with intersectionality theory, which shifts the focus from individual-level conceptualizations of culture to structural examinations that account for the power dimensions of race, class, gender, and immigrant status hierarchies (Crenshaw, 2013). By recognising how these intersect to shape health inequities, intersectionality provides a critical framework for understanding the unique lived experiences of Black African women. The implications for practice are clear: interventions must move beyond one-size-fits-all models to embrace cultural specificity, ensuring that health promotion programs address both the structural and cultural determinants of health. The qualitative study of study 4 reinforces this need, showing that the intersection of acculturation, cultural identity, and practical barriers like food access must be addressed for interventions to be effective. The review also highlighted the need for more long-term evaluations, which could guide the development of sustainable interventions and cost effective that not only achieve short-term weight loss but also foster lasting behavioural changes. This emphasis on long-term impact is crucial for interventions aimed at reducing obesity-related health disparities in marginalised groups.

8.4 Dietary Patterns of Black African Women in the UK

Study 3's analysis of the dietary patterns of Black African women in the UK offers significant insights into the nutritional habits and food choices of this population, an area previously under-researched. The study found that while Black African women consume a relatively high intake of fruits and vegetables and rich in whole grains, they exhibit a high intake of red meat and processed foods with increased risk of many chronic diseases. Additionally, this study identified four distinct dietary patterns—Western, African style, Plant-Based and Sugar, and Meat-Centric—providing a comprehensive framework for understanding the dietary habits of Black African women in the UK.

These patterns reflect a complex interaction between cultural retention, socio-economic status, and the food environment, yet they also reveal disparities in nutrient intake based on socio-demographic factors.

A key innovation in this study was the modification of the EPIC FFQ to include traditional African foods, aiming to enhance its cultural relevance and accuracy for this population. The inclusion of culturally specific foods and serving sizes was supported by a validation study (study 3), which indicated that the modified tool effectively captured dietary intake in this group. While further use in diverse settings will strengthen its generalisability, this modification addresses a critical gap in dietary assessment tools in the UK and represents a step toward more inclusive and representative dietary research.

The contributions of this PhD work directly led to the update of the Intake24 platform, which now includes culturally relevant foods tailored to the dietary practices of ethnic minority groups. These updates, such as African foods, culturally specific serving size options, tailored meal preparation methods and culturally relevant food photographs, provide a powerful tool for future dietary assessments in diverse populations in the UK. This is a novel advancement, as many existing dietary tools fail to capture the dietary nuances of ethnic minority groups, leading to incomplete or inaccurate data. The incorporation of culturally specific foods into these platforms highlights the need for ongoing efforts to adapt research methods to reflect the dietary practices of marginalised populations.

The implications for practice involve utilising culturally tailored dietary tools to better understand the specific nutritional needs of Black African women. These tools can provide critical insights that inform more personalised and effective nutrition interventions. Furthermore, the findings highlight significant opportunities for targeted strategies aimed at improving diet quality in this group.

Addressing dietary patterns, such as high intakes of sugar, protein, carbohydrates, and sodium, could play a key role in mitigating the health risks associated with nutrient imbalances and deficiencies.

Additionally, the qualitative findings in study 4 enrich this understanding by providing deeper insights into how food preferences are shaped by health concerns, acculturation processes and family influences. It revealed that many participants, while aware of the importance of increasing fruit and vegetable intake, face practical barriers such as lack of access to these foods in their communities and cost constraints. These insights underscore the broader trends, where Black African women showed a strong preference for culturally familiar foods, which often lacked the variety and nutritional balance recommended for health. This connection reinforces the importance of culturally sensitive interventions that focus on not just promoting healthy foods but also improving access to culturally appropriate and affordable options.

8.5 Development of a Culturally Sensitive Intervention

Study 5 represents a significant innovation by developing a protocol for a culturally sensitive weight management intervention—BALANCED— specifically for Black African women with overweight and obesity in the UK. The intervention was informed by the findings from Studies 1, 3, 4 and input from these Black women themselves, ensuring that it was not only theoretically sound but also culturally attuned to the target population's needs and preferences. This approach resulted in the development of an intervention protocol that is highly relevant and more likely to be acceptable, fostering a greater likelihood of participant engagement and adherence.

To illustrate, the qualitative study and co-participatory interviews provided further context, offering additional details about the cultural and social barriers Black African women face when trying to make dietary changes. Additionally, the importance of maintaining traditional food practices within the family, alongside concerns about losing cultural identity through dietary change, were important findings in the qualitative study. This aligns with the broader needs highlighted in this intervention,

where community-based solutions and family involvement were identified as key elements to achieving successful outcomes in weight management.

A key strength of the BALANCED intervention proposed in this thesis is its use of the Behaviour Change Wheel and COM-B model. This process identified key behaviours and tailored strategies to the needs of Black African women. It employed the use of multiple BCTs, including goal setting, self-monitoring, and social support, all of which have been shown to be effective in behaviour change (Cahill et al., 2018; Haire-Joshu et al., 2019). Additionally, the flexibility of this intervention, which allows for individual customisation, further enhances its potential effectiveness. For instance, it can be tailored to accommodate specific cultural dietary preferences, socioeconomic constraints, and varying levels of health literacy among women. This adaptability facilitates the potential of the intervention to address unique circumstances such as family dynamics, time limitations, and accessibility to healthier food options, thereby making it more relevant and practical for the diverse challenges these women face.

Although this intervention has not yet been piloted, its design suggests the potential for scalability and adaptability to other populations. However, it must first be piloted and evaluated to confirm its effectiveness. A key feature is the integration of trained practitioners who are not only culturally competent but also skilled in delivering behaviour change interventions. The involvement of practitioners during the development process further strengthens the intervention, ensuring that it is both practical and aligned with the realities of implementation. While these design features indicate potential for scalability, this cannot be confirmed without further evaluation. Specifically, a pilot study and economic or cost/benefit analysis would be required to fully assess the feasibility, scalability, and cost-effectiveness of the intervention. This PhD research underscores the importance of training health professionals in cultural competence and client-centred counselling skills to

enhance the effectiveness and applicability of weight management programs tailored to minority populations.

8.6 Broader Implications and Future Directions

The broader implications of this research extend across multiple levels of the SEM, addressing individual, interpersonal, and environmental factors that influence dietary behaviours and weight management (Caperon et al., 2022). The SEM provided a framework for understanding these factors and interpreting the findings, while the COM-B model informed the design of the BALANCED intervention by identifying the specific capabilities, opportunities, and motivations needed for behaviour change.

The bespoke EPIC FFQ, the enhanced Intake24 platform, and the development of a culturally sensitive weight management intervention collectively contribute to a more nuanced and inclusive understanding of Black African women's health. This research underscores the importance of moving beyond individual behaviour change interventions to address the structural and environmental factors that shape health outcomes.

Policy interventions in addition to the intervention developed in the present thesis that improve access to healthy foods, promote economic stability, and tackle systemic inequities are essential for creating environments that support healthier choices (Marmot, 2013). This calls for a multi-level approach to health promotion, integrating individual, community, and policy-level interventions to effectively reduce health disparities and advance equitable health outcomes.

Future research should focus on piloting, and evaluating the scalability and cost-effectiveness of the BALANCED intervention developed in this PhD. Long-term follow-up studies are also crucial to assessing the sustainability of behaviour change and its impact on health outcomes over time.

Additionally, future studies should explore how migration status, acculturation, and socioeconomic

factors interact to shape dietary behaviours and health risks, providing more insights into how different factors influence health outcomes.

Furthermore, there is a need for more comparative studies that assess the effectiveness of different behaviour change techniques in diverse cultural contexts, particularly in resource-constrained settings. As public health efforts increasingly focus on reducing health inequalities, it is critical to examine the economic feasibility of implementing such interventions on a larger scale, particularly in low-income communities where access to resources may be limited.

8.7 Study Limitations

Despite the many strengths and novelties of this PhD work, some limitations are present that warrant consideration. These include potential biases in self-reported dietary and anthropometric data, the cross-sectional nature of some studies that limits causal inference, and challenges in capturing the full diversity of Black African women's experiences. Additionally, while the systematic review provided valuable insights, its reliance on studies in the US and the exclusion of participant details such as migration status may limit the generalisability of findings to the broader Black African migrant population. The validation of dietary assessment tools revealed over-reporting of some nutrient intakes, and the relatively short data collection period may influence the precision of dietary assessments. Furthermore, while snowball sampling was effective for reaching the target population, it may limit the generalisability of findings to the wider Black African community. Lastly, the absence of key motivational factors in the behaviour change model and the lack of standardised measures for evaluating the predictive validity of interventions present important considerations. Despite these limitations, the comprehensive, culturally sensitive, and theoretically grounded approach remains a significant contribution to the field of health promotion.

8.8 Conclusion

This PhD research exemplifies a pioneering effort to address the complex and often overlooked health needs of Black African women in the UK, significantly advancing the fields of dietary assessment, weight management, and culturally sensitive health promotion. By integrating innovative methodologies with a client-centred and community-informed approach, this work establishes a robust foundation for developing equitable health solutions.

At its core, the research highlights the transformative potential of culturally tailored interventions and culturally competent health professionals, illustrating their capacity to improve health outcomes while addressing systemic health disparities. The methodological advancements—such as adapting the EPIC FFQ and expanding the Intake24 platform—go beyond technical achievements, setting new standards for inclusivity in dietary research. These tools provide a template for enhancing the representation of minority groups in dietary studies globally and advancing research in this previously under-researched group.

The findings also underscore the critical role of cultural competence and practitioner input in designing health interventions that resonate with target populations. This study uniquely bridges theoretical rigour with real-world applicability, contributing practical strategies for creating sustainable health promotion programs. By addressing both individual behaviours and broader structural determinants of health, it provides a comprehensive framework for tackling obesity-related challenges in marginalised communities.

Looking forward, this PhD research opens pathways for scaling and adapting its findings to other populations and settings, particularly in addressing health inequalities within countries such as the UK. The innovations and insights presented here will inform future research to refine, evaluate, and implement culturally sensitive interventions that have potential to be impactful and sustainable in other cultures.

Overall, this PhD lays the groundwork for a paradigm shift in health promotion, emphasising the need for culturally attuned, client-centred approaches. The body of work culminates in the development of an evidence-based, theoretically driven, and culturally sensitive intervention—the BALANCED program designed for use in an under-researched and marginalised population. Its contributions will serve as a catalyst for advancing health equity, improving the well-being of Black African women, and shaping a more inclusive and just public health landscape.

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Appendices

Appendix 1: Search string

Counselling	counselling or counseling or behavioural therapy or behavioral therapy or treatment or motivational interviewing or mi or motivational interview or behavioural counselling or behavioral counseling or shared decision making or behavioural treatment or behavioral treatment or behavioural approach or behavioral approach or motivational enhancement or motivational counselling or motivational counseling or behaviour modification or behavior modification or behavioural therapy or cognitive-behaviour therapy or cognitive-behavior therapy or cognitive-behavioural therapy or cognitive-behavioral therapy or dietary counselling or nutritional counselling or health counselling or dietary counseling or nutritional counseling or health counseling
	AND
Client centred	client centred or client centered or client-centred counselling or client-centered counseling or client centred therapy or client centered therapy or person centred therapy or person centered therapy or individual or person-centred or person-centered or nondirective counselling or nondirective counseling or individual counselling or individual counseling or nondirective therapy
	AND
Weight management or weight loss	weight loss or weight reduction or lose weight or obesity or overweight or weight management or weight approach or wloss strategy or weight loss programme or weight maintenance or weight control or control of body weight or weight reduction or weight reducing or reduction of weight or loss of weight or losing weight or slimming or reducing
	AND
Black, African ethnic group	bme or bame or black minority ethnic or ethnic group or black africans or black or African or black ethnic or ethnic minority or ethnic minority group

Appendix 2

CONFIDENTIAL

STUDY NUMBER:

FOOD FREQUENCY QUESTIONNAIRE

This questionnaire asks for some background information about you, especially about what you eat.

Your answers will be treated as strictly confidential and will be used only for medical research.

PLEASE COMPLETE USING BLACK INK/PEN

Date of birth:

Please enter: M if you are Male ☐
F if you are Female ☐

Please answer every question. If you are uncertain about how to answer a question then do the best you can, but please do not leave a question blank.

CAMB/PQ/6/1205

1. **YOUR DIET LAST YEAR**

For each food there is an amount shown, either a “medium serving” or a common household unit such as a slice or teaspoon. Please put a tick (✓) in the box to indicate how often, **on average**, you have eaten the specified amount of each food **during the past year**.

EXAMPLES:

For white bread the amount is one slice, so if you ate 4 or 5 slices a day, you should put a tick in the column headed “4-5 per day”.

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
BREAD AND SAVOURY BISCUITS (one slice or biscuit)	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
White bread and rolls								✓	

For chips, the amount is a “medium serving”, so if you had a helping of chips twice a week you should put a tick in the column headed “2-4 per week”.

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
POTATOES, RICE AND PASTA (medium serving)	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
Chips				✓					

For very seasonal fruits such as strawberries and raspberries you should estimate your average use when the fruits are in season, so if you ate strawberries or raspberries about once a week when they were in season you should put a tick in the column headed “once a week”.

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
FRUIT (1 fruit or medium serving)	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
Strawberries, raspberries, kiwi fruit			✓						

Please estimate your average food use as best you can, and please answer every question
– do not leave ANY lines blank. PLEASE PUT A TICK (✓) ON EVERY LINE

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
MEAT AND FISH (medium serving)	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
Beef: roast, steak, mince, stew or casserole or suya									
Beefburgers									
Goat meat: roast, chops, stew or slices									
Cow leg, cow tail									
Pork: roast, chops, stew or slices									
Lamb: roast, chops or stew									
Chicken or other poultry eg. turkey									
Bacon									
Ham									
Corned beef, Spam, luncheon meats									
Sausages									
Savoury pies, eg. meat pie, pork pie, pasties, steak & kidney pie, sausage rolls									
Liver, liver paté, liver sausage									
Fried fish in batter, as in fish and chips									
Fish fingers, fish cakes									
Fish (fresh or frozen or dried)									
Other white fish, fresh or frozen, eg. cod, haddock, plaice, sole, halibut									
Oily fish, fresh or canned, eg. mackerel, kippers, tuna, salmon, sardines, herring									
Shellfish, eg. crab, prawns, mussels									
Fish roe, taramasalata									
	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day

Please check that you have a tick (✓) on EVERY line

PLEASE PUT A TICK (✓) ON EVERY LINE

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
BREAD AND SAVOURY BISCUITS (one slice or biscuit)	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
White bread, African bread, rolls									
Brown bread and rolls									
Wholemeal bread and rolls									
Cream crackers, cheese biscuits									
Crispbread, eg. Ryvita									
CEREALS (one bowl)									
Porridge, oatmeal (e.g quaker oats), Readybrek									
Breakfast cereal such as cornflakes, muesli etc.									
POTATOES, RICE AND PASTA (medium serving)									
Boiled, mashed, instant or jacket potatoes									
Chips									
Roast potatoes									
Potato salad									
White rice									
White rice and beans, waakye									
Jollof rice									
Fried rice									
Brown rice									
White or green pasta, eg. spaghetti, jollof spaghetti, macaroni, noodles									
Boiled yam, fried yam									
Fufu, garri/eba, pondo yam, semovita or semolina, banku, kenkey, amala									
Akara, moi moi									
Wholemeal pasta									
Lasagne, moussaka									
Pizza									
	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day

Please check that you have a tick (✓) on EVERY line

PLEASE PUT A TICK (✓) ON EVERY LINE

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
DAIRY PRODUCTS AND FATS	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
Single or sour cream (tablespoon)									
Double or clotted cream (tablespoon)									
Low fat yogurt, fromage frais (125g carton)									
Full fat or Greek yogurt (125g carton)									
Dairy desserts (125g carton)									
Cheese, eg. Cheddar, Brie, Edam (medium serving)									
Cottage cheese, low fat soft cheese (medium serving)									
Eggs as boiled, fried, scrambled, etc. (one)									
Quiche (medium serving)									
Low calorie, low fat salad cream (tablespoon)									
Salad cream, mayonnaise (tablespoon)									
French dressing (tablespoon)									
Other salad dressing (tablespoon)									
The following on bread or vegetables									
Butter (teaspoon)									
Block or hard margarine, eg. Stork, Krona (teaspoon)									
Polyunsaturated margarine, eg. Flora, sunflower, soya spreads (teaspoon)									
Soft margarines, including olive oil based and dairy spreads, eg. Blue Band, Clover (teaspoon)									
Low fat spreads (less than 60% fat), eg. Outline, Gold (teaspoon)									
Very low fat spread (less than 30% fat) (teaspoon)									
	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day

Please check that you have a tick (✓) on EVERY line

PLEASE PUT A TICK (✓) ON EVERY LINE

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
SWEETS AND SNACKS (medium serving)	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
Sweet biscuits, chocolate , eg. digestive (one)									
Sweet biscuits, plain, eg. Nice, ginger (one)									
Cakes eg. fruit, sponge, home baked									
Cakes eg. fruit, sponge, ready made									
Buns, pastries eg. scones, flapjacks, home baked									
Buns, pastries eg. croissants, doughnuts, ready made									
Fruit pies, tarts, crumbles, home baked									
Fruit pies, tarts, crumbles, ready made									
Sponge puddings, home baked									
Sponge puddings, ready made									
Milk puddings, eg. rice, custard, trifle, pap/akamu									
Ice cream, choc ices									
Chocolates, single or squares									
Chocolate snack bars eg. Mars, Crunchie									
Sweets, toffees, mints									
Sugar added to tea, coffee, cereal (teaspoon)									
Crisps or other packet snacks, eg. Wotsits, plantain chips									
Peanuts (groundnuts) or other nuts or kuli kuli									
Chin chin									
Puff puff									
SOUPS, SAUCES, AND SPREADS									
Vegetable soups and other soups e.g eforiro ndole, eru, ewedu, groundnut soup, bean soup (bowl)									
Meat soups (bowl) e.g egusi soup, okro soup/stew, Tomatoes stew, pepper soup, , kondre									
Fish soups e.g fist tomatoes stew (bowl)									
Tomatoes egg sauce									
Beans porridge									
Sauces, eg. white sauce, cheese sauce, gravy, maggi, shito sauce (tablespoon)									
Tomato ketchup (tablespoon)									
Pickles, chutney (tablespoon)									
Marmite, Bovril (teaspoon)									
Jam, marmalade, honey (teaspoon)									
Peanut butter (teaspoon)									

	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day

Please check that you have a tick (✓) on EVERY line

PLEASE PUT A TICK (✓) ON EVERY LINE

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
DRINKS	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
Tea (cup)									
Coffee, instant or ground (cup)									
Coffee, decaffeinated (cup)									
Coffee whitener, eg. Coffee-mate (teaspoon)									
Cocoa, hot chocolate (cup)									
Horlicks, Ovaltine, milo (cup)									
Wine (glass)									
Malt or Malta Guinness (glass)									
Beer, lager or cider (half pint)									
Port, sherry, vermouth, liqueurs (glass)									
Spirits, eg. gin, brandy, whisky, vodka (single)									
Low calorie or diet fizzy soft drinks or zobo drink (glass)									
Fizzy soft drinks, eg. Coca cola, lemonade, La Casera(glass)									
Pure fruit juice (100%) eg. orange, apple juice (glass)									
Fruit squash or cordial (glass)									
FRUIT									
For seasonal fruits marked *, please estimate your average use when the fruit is in season									
Apples (1 fruit)									
Pears (1 fruit)									
Oranges, satsumas, mandarins (1 fruit)									
Grapefruit (half)									
Bananas (1 fruit)									
Grapes (medium serving)									
Watermelon or Melon (1 slice)									
* Peaches, plums, apricots (1 fruit)									
* Strawberries, raspberries, kiwi fruit (medium serving)									
Tinned fruit (medium serving)									

Dried fruit, eg. Dates, raisins, prunes (medium serving)									
	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day

Please check that you have a tick (✓) on EVERY line

PLEASE PUT A TICK (✓) ON EVERY LINE

FOODS AND AMOUNTS	AVERAGE USE LAST YEAR								
VEGETABLES Fresh, frozen or tinned (medium serving)	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day
Carrots									
Spinach (Efo) or ugu, okazi, eru, bitter leaf									
Broccoli, spring greens, kale									
Brussels sprouts									
Cabbage									
Peas									
Green beans, broad beans, runner beans									
Marrow, courgettes									
Cauliflower									
Parsnips, turnips, swedes									
Leeks									
Onions									
Garlic									
Mushrooms									
Sweet peppers									
Beansprouts									
Green salad, lettuce, cucumber, celery									
Watercress									
Tomatoes									
Sweetcorn									
Beetroot									
Coleslaw									
Avocado									
Baked beans									
Dried lentils, beans, peas									
Tofu , soya meat, TVP, Vegeburger									
	Never or less than once/month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day	2-3 per day	4-5 per day	6+ per day

Please check that you have a tick (✓) on EVERY line

YOUR DIET LAST YEAR, continued

2. Are there any **OTHER** foods which you ate more than once a week? Yes ☐ No ☐
If **YES**, please list below

Food	Usual serving size	Number of times eaten each week

3. What type of milk did you most often use?

Select one only

Full cream/whole	☐	Semi-skimmed	☐
Skimmed	☐	Channel Islands, gold	☐
Dried milk	☐	Soya	☐
Other, specify		None	☐

4. How much milk did you drink each day, including milk with tea, coffee, cereals etc?

None	☐	Three quarters of a cup	☐
Quarter of a cup	☐	One cup	☐
Half a cup	☐	More than one cup	☐

5. Did you usually eat breakfast cereal (excluding porridge, oatmeal (quaker oats) and Ready Brek mentioned earlier)?

Yes ☐ No ☐

If **YES**, which brand and type of breakfast cereal, including muesli, did you usually eat?

List the one or two types most often used

Brand e.g. Kellogg's	Type e.g. cornflakes

6. What kind of fat did you most often use for frying, roasting, grilling etc?

Select one only

Butter	☐	Solid vegetable fat	☐
Lard/dripping	☐	Margarine	☐
Vegetable oil	☐	None	☐

If you used vegetable oil, please give type eg. corn, sunflower

7. What kind of fat did you most often use for baking cakes etc?

Select one only

Butter	☐	Solid vegetable fat	☐
Lard/dripping	☐	Margarine	☐
Vegetable oil	☐	None	☐

If you used margarine, please give name or type eg. Flora, Stork

8. How often did you eat food that was fried at home?
 Daily ☐ 1-3 times a week ☐ 4-6 times a week ☐
 Less than once a week ☐ Never ☐
9. How often did you eat fried food away from home?
 Daily ☐ 1-3 times a week ☐ 4-6 times a week ☐
 Less than once a week ☐ Never ☐
10. What did you do with the visible fat on your meat?
 Ate most of the fat ☐ Ate as little as possible ☐
 Ate some of the fat ☐ Did not eat meat ☐
11. How often did you eat grilled or roast meat? times a week
12. How well cooked did you usually have grilled or roast meat?
 Well done /dark brown ☐ Lightly cooked/rare ☐
 Medium ☐ Did not eat meat ☐
13. How often did you add salt to food while cooking?
 Always ☐ Rarely ☐
 Usually ☐ Never ☐
 Sometimes ☐
14. How often did you add salt to any food at the table?
 Always ☐ Rarely ☐
 Usually ☐ Never ☐
 Sometimes ☐
15. Did you regularly use a salt substitute (eg LoSalt)? Yes ☐ No ☐
 If YES, which brand?

16. During the course of last year, on average, how many times a week did you eat the following foods?

Food type	Times/week	Portion size
Vegetables (not including potatoes)		medium serving
Salads		medium serving
Fruit and fruit products (not including fruit juice)		medium serving or 1 fruit
Fish and fish products		medium serving
Meat, meat products and meat dishes (including bacon, ham and chicken)		medium serving

17. Have you taken any vitamins, minerals, fish oils, fibre or other food supplements during the past year?

- ☐ Yes
☐ No
☐ Sometimes
☐ Don't know

If **YES** or **SOMETIMES**, please complete the table below.

If you have taken more than 8 types of supplement please put the most frequently consumed brands first.

Example: If you take one tablet of vitamin C two times a day, please write '2' in the amount-column and tick (3) the 'once a day' box. Most supplements mention a strength value (in our example 500mg), please write this information in the table.

Supplements				Average frequency for the past year Tick (3) ONE box per line to show how often on average you took the amount consumed as mentioned in 'amount' column.					
Brand	Name	Strength (strength of the supplement for each tablet or capsule)	Amount (number of tablets, capsules or teaspoons taken in one day)	Never or less than once a month	1-3 per month	Once a week	2-4 per week	5-6 per week	Once a day
Boots	High strength vitamin C	500mg	2 tablets						3

Thank you for your help

Appendix 3

Approval Sheet

(This sheet must be signed at all relevant boxes)

Name of proposer(s)	Itse Olaoye
Name of supervisor(s)	Associate Prof Nicola Brown, Dr Kyriaki Myrissa, Dr Eirini Kelaiditi, Dr Fotini Tsofliou
Programme of study	PhD Health Studies
Title of project	Assessment of dietary patterns, barriers and facilitators to healthy eating among black African women in the UK

Supervisors, please complete section 1. If approved at level 1, forward a copy of this Approval Sheet to the Faculty Ethics Representative for their records.

SECTION 1: To be completed by supervisor. (For student research projects).
Doctoral/MPhil applications must be referred to and reviewed by an Ethics Representative at Section 2 below.

☐ Approved at Level 1.

☒ Refer to Ethics Representative for consideration.

Name of Supervisor:	Nicola Brown		
Signature of Supervisor:		Date:	02/08/22

SECTION 2: To be completed by Ethics Representative.

☐ Approved at Level 1

☒ Approved at Level 2

☐ Level 3 consideration is required by Ethics Sub-Committee.

Name of Faculty Ethics Representative:	Yiannis Mavrommatis		
Signature of Faculty Ethics Representative:		Date:	02/08/22

Appendix 4: In-depth one-on-one interview guide

Family members and food:

- Who in your family is responsible for getting food and cooking?
- Who are the members of the family who influence getting food and cooking?
- Since moving from your home country to the UK, what are your experiences?

Food Sources and Shopping

- Can you tell me about a typical food shopping experience in your home country?
- Can you tell me about a typical food shopping experience in the UK?
- Is there anything that stands out as different to you? Anything more or less challenging?
- What is your experience on finding foods that you used to eat at home?

Household Income issues:

- How do you budget for food? (Probe whether they have enough money)
- What do you think about the food prices in the UK??

UK food:

- What comes to mind when you think about UK food?
- How do you feel about the quality of food in the UK?

Food and identity:

- What does your traditional food mean to you?
- How accepting are others of the food you and your family eat?
- Are you able to eat the way you want to in the UK? (Probes: time, access to food, acceptance, income)

Eating out:

- Are there times when you eat out? And how often?
- Where do you usually eat out? And with whom?
- Has this changed since you moved to the UK?

Dietary change:

- In general, do you think diets change over time in the UK for better or worse?
- How do you feel about your diet in the UK when compared to when you were in your home country?
- Is that different for different members of your family?
- If yes, what has caused your diet to change?

Nutrition intervention:

- What do you think a healthy diet is?
- What types of things did you need to learn when you first came to the UK in order to prepare and get food for your family?
- What things do you still need to learn?
- When you came to the UK, where did you get information about where to buy food and how to prepare it? Has that changed over time since you've been in the UK?
- Do you feel that there are enough sources of information available for you to learn about healthy eating? If not, what would be the best way for you to learn this information?
- Are you aware of the nutrition/diet-related services that are available in the UK?

- If so, are there enough services available to help you with your nutrition and diet related
- needs? If not, what kinds of services do you think should be available to help you with these issues?
- What services would help you with nutrition/diet-related health concerns?
- What factors will make you want to participate in a healthy lifestyle program/study?
- What factors will make you NOT want to participate in a healthy lifestyle program/study?
- What cultural factors do you think needs to be considered when developing/implementing a healthy lifestyle program?
- What do you think are the benefits of attending a healthy lifestyle program for Black African women?
- What sort of time would you be willing to commit to in terms of hours per week and number of times per week?
- Would you prefer for these sessions to be held in person face to face or virtually, one-on-one or in group or through an app which you can administer at your own time?
- What do you think the main barriers are in terms of getting people to enrol in this study and getting them to complete the full intervention and not drop out?
- What would help keep you and people in the study?
- Are financial incentives important?
- Where do you think we should advertise for volunteers for the study?
- Is there anything we should include to make it more acceptable and attractive to people?



Appendix 5: Participants Consent Form for Surveys

Name of Participant: _____

Title of the project: Assessment of dietary patterns among black African women in the UK

Principal investigator and contact details: Itse Olaoye, 2113414@live.stmarys.ac.uk

Members of the research team: Associate Prof Nicola Brown, Dr Kyriaki Myrissa, Dr Eirini Kelaiditi, Dr Fotini Tsofliou

1. I agree to take part in the above research. I have read the Participant Information Sheet which is attached to this form. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.
2. I understand that I am free to withdraw from the research at any time, for any reason and without prejudice.
3. I have been informed that the confidentiality of the information I provide will be safeguarded.
4. I am free to ask any questions at any time before and during the study.
5. I have been provided with a copy of this form and the Participant Information Sheet.

Data Protection: I agree to the University processing personal data which I have supplied. I agree to the processing of such data for any purposes connected with the Research Project as outlined to me.

Name of participant
(print).....

Signed.....

Date.....

If you wish to withdraw from the research, please contact the principal investigator on the contact details above [or leave a telephone message on 02082402321].



Appendix 6: Participants Consent Form for Interviews

Name of Participant: _____

Title of the project: Assessment of dietary patterns, barriers and facilitators to healthy eating among black African women in the UK

Principal investigator and contact details: Itse Olaoye, 2113414@live.stmarys.ac.uk

Members of the research team: Associate Prof Nicola Brown, Dr Kyriaki Myrissa, Dr Eirini Kelaiditi, Dr Fotini Tsofliou

1. I agree to take part in the above research. I have read the Participant Information Sheet which is attached to this form. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.
2. I understand that I am free to withdraw from the research at any time, for any reason and without prejudice.
3. I have been informed that the confidentiality of the information I provide will be safeguarded.
4. I am free to ask any questions at any time before and during the study.
5. I have been provided with a copy of this form and the Participant Information Sheet.

Data Protection: I agree to the University processing personal data which I have supplied. I agree to the processing of such data for any purposes connected with the Research Project as outlined to me.

Name of participant (print).....

Signed.....

Date.....

If you wish to withdraw from the research, please contact the principal investigator on the contact details above [or leave a telephone message on 02082402321].

Appendix 7: PARTICIPANT INFORMATION SHEET FOR SURVEYS

Title of project

Assessment of dietary patterns among black African women in the UK

Purpose and value of study

This study aims to explore dietary patterns and attitudes, and behaviours towards healthy eating among Black African women from sub-Saharan Africa living in the UK. We are hoping that the results from this study will inform the development of a culturally specific and relevant nutritional intervention, with an ultimate goal of improving healthy lifestyle among black African women in the UK.

To achieve this, I would like you to complete a survey on what you eat.

Who can take part in this study?

To take part in this study, you need to be above 18 years of age, from sub-Saharan Africa and overweight or obese.

Do I have to take part?

It is up to you to decide whether or not to take part. Before you decide, we would like you to understand why the research is being done and what it would involve for you. If you do decide not to take part, this will not affect you in any way. You can withdraw from participation at any time and without giving a reason. If you do withdraw from the study at any stage, information collected about you during the study may still be used unless you ask for it not to be.

What will happen to me if I take part in the study?

If you are interested in participating, you will be asked to complete the following questionnaires:

1. A questionnaire to capture information of your age, country of origin, level of education, income, duration of stay in the UK, migration status, employment, marital status, weight and height.
2. A 24hr dietary recall- this involves you logging all food and drink intake over a 24 hour period. You will be asked to complete this on two week days, and one weekend day.
3. A food frequency questionnaire will also be administered to you after the completion of the dietary recalls.

After taking part in the study you will be entered into a prize draw to win a £100 gift voucher.

How much time they will need to give up to take part in the project?

Each 24 hr dietary recall and the food frequency questionnaire will take approximately 30 minutes to complete, totalling approximately two hours of your time. You can complete these questionnaires at your convenient time, online or if you wish it to be administered to you physically.

What are the possible benefits of taking part?

You may benefit from an increased awareness of your eating patterns and will also be contributing to a better understanding of your needs as a Black African woman living in the UK and collaboratively be involved in the co-development of the culturally sensitive African nutritional intervention.

What are the possible disadvantages and risks of taking part?

No detrimental effects are expected as a result of you taking part in this survey. Research studies are strictly regulated and it is important that you fully understand all the implications of your participation. If you feel upset or become distressed in the course of completing the questionnaires, or afterwards, please let the researcher know, she will be happy to discuss anything with you. Also, If you have a concern about any aspect of this study, also speak to the researcher who will answer your questions.

Who is organising the research?

The study is being conducted by Itse Olaoye who is a PhD student at St Mary's University, Twickenham, London and supervised by Associate Prof Nicola Brown, Dr Kyriaki Myrissa, Dr Eirini Kelaiditi who are lecturers from St Mary's University, Twickenham, London and also co-supervised by Dr Fotini Tsofliou from Bournemouth University.

What will happen to the results of the study?

Data will be analysed and written up in the form of a PhD thesis, and may also be presented at conferences or published in a scientific journal. No identifiable information will be published and a summary of results will be made available to you on request.

What will happen to any information/data collected from you?

The UK Data Protection Act 2018, including the GDPR guidelines, will be upheld at all times to ensure your data remains confidential. St Mary's University, Twickenham is the sponsor for this study based in the United Kingdom. All data will be stored on the St. Mary's University servers and protected by the Microsoft password two-factor authentication system.

Contact details for further information

If you are interested in participating in the study, or would like to receive further information about the study, please contact the main investigator using the contact details below:

Researcher: Itse Olaoye, E-mail: 2113414@live.stmarys.ac.uk

Please note that you will be given a copy of this information sheet to keep together with a copy of your consent form

Appendix 8: PARTICIPANT INFORMATION SHEET FOR INTERVIEWS

Title of project

Assessment of dietary patterns, barriers and facilitators to healthy eating among black African women in the UK

Purpose and value of study

This study aims to explore the dietary patterns, attitudes, behaviours on healthy eating and physical activity and associated factors among Black African women from sub-Saharan Africa living in the UK. We are hoping that the results from this study will inform the development of a culturally specific and relevant nutritional intervention through a community based participatory research approach, with an ultimate goal of improving healthy lifestyle among black African women in the UK.

To achieve this, I would like to talk to you about your experiences for about an hour and half at a time only at your convenience.

Who can take part in this study?

To take part in this study, you need to be above 18 years of age, from sub-Saharan Africa and overweight or obese.

Do I have to take part?

It is up to you to decide whether or not to take part. Before you decide, we would like you to understand why the research is being done and what it would involve for you. If you do decide not to take part, this will not affect you in any way. You can withdraw from participation at any time and without giving a reason. If you do withdraw from the study at any stage, information collected about you during the study may still be used unless you ask for it not to be.

What will happen to me if I take part in the study?

If you are interested in participating, the researcher will contact you and arrange to meet with you at a mutually convenient location. During this visit the researcher will:

- Explain the study in full to you
- Ask you to sign an informed consent form
- Check that you appear eligible to participate in the study
- If you meet the study criteria, a meeting date and time will be set

At the meeting set, an interview will take place to discuss your experiences on your dietary practices following migration into the UK. This discussion will be conducted in a suitable place, wherever you prefer. It is expected that this discussion will last about one hour and will be audiotaped. Information from the recording of this interview will be put into an anonymously written form and the original recording destroyed. No other use will be made of them without your consent. If you wish, this information will be sent to you so that you can either agree or disagree if it reflects what you said.

After completing the interview you will be entered into a prize draw to win a £100 gift voucher.

How much time they will need to give up to take part in the project?

The maximum duration in participating in this study will be one hour only at a convenient time and location of your choosing, physically or online.

What are the possible benefits of taking part?

You may benefit from an increased awareness of the rate of obesity, risk factors of obesity and possible strategies to addressing these challenges. You will also be contributing to a better understanding of your needs as a Black African woman living in the UK and collaboratively be involved in the co-development of the culturally sensitive African nutritional intervention.

What are the possible disadvantages and risks of taking part?

No detrimental effects are expected as a result of you taking part in this survey. Research studies are strictly regulated and it is important that you fully understand all the implications of your participation. If you feel upset or become distressed in the course of completing the questionnaires, or afterwards, please let the researcher know, she will be happy to discuss anything with you. Also, if you have a concern about any aspect of this study, also speak to the researcher who will answer your questions.

Who is organising the research?

The study is being conducted by Itse Olaoye who is a PhD student at St Mary's University, Twickenham, London and supervised by Associate Prof Nicola Brown, Dr Kyriaki Myrissa, Dr Eirini Kelaiditi who are lecturers from St Mary's University, Twickenham, London and also co-supervised by Dr Fotini Tsofliou from Bournemouth University.

What will happen to the results of the study?

Data will be analysed and written up in the form of a PhD thesis, and may also be presented at conferences or published in a scientific journal. No identifiable information will be published and a summary of results will be made available to you on request.

What will happen to any information/data collected from you?

The UK Data Protection Act 2018, including the GDPR guidelines, will be upheld at all times to ensure your data remains confidential. St Mary's University, Twickenham is the sponsor for this study based in the United Kingdom. All data will be stored on the St. Mary's University servers and protected by the Microsoft password two-factor authentication system.

Contact details for further information

If you are interested in participating in the study, or would like to receive further information about the study, please contact the main investigator using the contact details below:

Researcher: Itse Olaoye, E-mail: 2113414@live.stmarys.ac.uk

Please note that you will be given a copy of this information sheet to keep together with a copy of your consent form

Appendix 9: Illustration of categories, sub-categories and focused codes that make up the category

Category	Sub-categories	Focused codes
Women's Individual Characteristics	Health Orientation	• Awareness of nutrition and health • Health concerns and awareness of health impacts • Rapid weight gain • Health diagnosis • Weight loss challenges • Concerns to raise healthy children
	Personal Food Preferences	• taste/preference for well-seasoned foods • difficulty eating local vegetables • reduced feeling of satisfaction (fullness) from British foods
Cultural and Social Influences	Family Dynamics	• Before Migration: Family preferences (children, partners), others (aunts/relatives/ friends) • Post Migration: children's preferences, School as a powerful assimilator, children as motors of change at home, partner/husband
	Cultural eating as part of identity	• Cultural identity • Emotional connection
Acculturation	Adaptation of food habits	• Adaptation to new food environments • Exploration of British cuisines • Easy access to British and prestigious foods • Use of local alternatives to African foods
	Psychological impact of acculturation	• Increased stress levels • Stress and anxiety-related eating
	Shift in food preparation responsibilities	• Before Migration: Parental role, use of maids/help, men/husband, relatives • Post Migration: • Lack of help • Partners' limited involvement • Lack of support system • DIY food preparation
Barriers to healthy eating	Accessibility, affordability and availability	Economic factors • Inflation of food prices

		• financial stress • Reduction in variety and quantity of food items <i>Variations in Availability, Quality, and Cost of Cultural Foods</i> • Before Migration: easy access to food items, fresh foods, cheap foods, convenience and accessibility of local markets, open markets, one-stop shops • Post Migration: High cost of African foods, limited availability, far-distance travel to African stores, shopping at specialty shops, quality issues with imported ingredients, frozen foods or wilted vegetables.
	work and living constraints	Time • Busy and complex lifestyles • Stressful and time-intensive traditional cooking practices • Impact of sedentary jobs on physical activity • Impact of weather on physical activity • Reception/reaction of others on traditional foods at work or home • Lack of motivation to engage in physical activity • Laziness to engage in physical activity • Lack of enjoyable physical activity routines Convenience and shortcuts • Reduced frequency of cooking traditional foods • Increased dining out • Reliance on food delivery services • Convenience meals • Celebratory dining

Appendix 10: Table showing In-depth Interview questions asked to Black African women with overweight and obesity in the UK in accordance with the TDF and COM-B model

COM-B Component	TDF Domain	Questions	Sample Excerpts
Psychological Capability	Knowledge	• What do you think a healthy diet is? • What's your understanding of a healthy diet? • Are you aware of the nutrition/diet-related services available in the UK? • What did you need to learn when you first arrived?	"A diet that contains all of the nutrients in the correct proportions for the individual, so taking into account what dietary, what health conditions the individual has. ... Peer pressure affects kids' food choices." "I've been taught to mentally share your plate: half for fruits/vegetables, one quarter for carbs, one quarter for proteins. I'm still learning healthier options and consistency in preparing balanced meals."
	Memory, Attention, and Decision Processes	• Do you feel that there are enough sources of information available for you to learn about healthy eating? If not, what would be the best way to learn?	"I asked a very simple question: 'Where are the resources?' Even when you try, something always stops you. It feels performative... like there's no real accessibility for Black women like me." "I didn't access these resources until my diagnosis. That was my wake-up call to explore apps, join a health club, and use their meal plans and tracking tools to gain knowledge about healthy living."
	Behaviour Regulation	• What things do you still need to learn?	"I need help passing knowledge down to my kids. They face peer pressure to make unhealthy choices. I also want to understand portion sizes better and how to adapt the science behind it for myself." "Learning to manage consistency in meal timing, portion control, and balancing cultural meals with new healthier options is a continuous process I'm navigating now."
Physical Capability	Skills	• What did you need to learn when you	"Places to get food... in the UK, you learn as you go. There

		first arrived in the UK to manage food for your family?	wasn't much guidance, and I had to adapt without proper support for cultural foods." "I didn't have to learn much initially since I had access to similar foods. But later, I learned to integrate UK options like bulgur, almond milk, and healthier oils into our meals."
Social Opportunity	Social Influences	• What cultural factors do you think need to be considered when developing a healthy lifestyle program?	"If you're not taking into consideration my cultural food and teaching me how to eat it healthily, the program won't work. Cultural food must be included to make the intervention sustainable." "Substituting African staples like yam with sweet potatoes or cooking beans without palm oil is a start. But cultural familiarity and gradual adaptation are key to acceptance."
Physical Opportunity	Environmental Context and Resources	• Where did you get information about food when you arrived? Has that changed? • Are there enough services? If not, what should be available? • How much time would you commit?	"You kind of learn as you go... there's little culturally relevant guidance on buying or preparing food. Accessing weight-loss services felt bureaucratic, with many delays and no clear resources." "...I've used tools like meal plans, gym programs, and tracking apps. I'm learning about affordable substitutions for healthier meals, but consistent and flexible resources would help."
Reflective Motivation	Beliefs about Consequences	• What are the benefits of attending a healthy lifestyle program for Black African women?	"Obesity and its health risks are still on the rise... How does the message translate into practical, actionable steps people can follow daily?" "It's crucial for our health and mental well-being. These programs help us balance our busy lives while managing risks like diabetes and hypertension,

			which are more prevalent among us."
	Social/Professional Role and Identity	• What factors will make you participate?	"If the program had proper physical activity and nutrition counseling and diagnostic tests, I would participate. I need evidence-based guidance, not a one-size-fits-all approach." "Seeing results motivates me. I joined a paid program to improve my health because I wanted to ensure changes that benefit my family long-term."
	Beliefs about Capabilities	• What are the main barriers to enrollment and completion?	"I feel like there's no diagnostic support to address unique needs like PCOS. If such conditions are ignored, participants may feel like failures and drop out." "Time and busy schedules are barriers. Programs must adapt to flexible timings and involve family support to make participation feasible, especially for those juggling multiple responsibilities."
	Intention	• What factors will make you participate? • What factors will make you not participate?	"I want guidance, like nutritional counseling tailored to my cultural needs, and not just general advice. Otherwise, it feels irrelevant to me." "I joined because of my diagnosis or pre-diabetes. Programs need to emphasize the personal health benefits. Without a compelling reason, many might not feel motivated."
Automatic Motivation	Reinforcement	• Are financial incentives important?	"I think it's just the willingness to do it. I think it's just also if people don't feel like it would add any value to their lives...people want to get paid to do just get these things, even if it's for their health, you know. People want to get paid to do those kinds of things, you know..."

			"For some, financial incentives could help. Personally, I paid to join a program because I valued the health benefits more than external rewards."
	Emotion	• What would help keep you and others in the study?	"The cycle of weight gain and stress is disheartening. A program that integrates mental health support with physical interventions would help." "Stress from balancing family meals and personal health goals often derails consistency. Shared goals with family or community support can be uplifting and motivating."

Appendix 11: Socio-demographic Questionnaire for Participants

Please answer the questions below. Feel free to skip any questions you do not feel comfortable answering. We will keep this information private and confidential. Please DO NOT write your name on this form.

ID number _____

Your weight (in kg) _____

Your height (in meters) _____

How old are you? _____

Are you married or living with common-law partner? Yes ☐ No ☐

Do you have children? Yes ☐ No ☐

If yes, how many children do you have? _____

Country of origin/birth _____

What year did you move to the UK? _____

Employment status

Full-time employed ☐
Part-time employed ☐
Unemployed ☐
Maternity leave ☐
Retired ☐

Level of education

None ☐
Did not finish high school ☐
High school ☐
Some College or university ☐
College diploma or university degree ☐

Household income

Less than £20,000 ☐
£20,000 – £39,000 ☐
More than £40,000 ☐

Migration status

First generation migrant ☐
Second generation migrant ☐

How long have you been living in the UK (yrs.)

<=5 years ☐
5-10 years ☐
10-15 years ☐
15-20 years ☐
≥21 years ☐

Appendix 12: List of Missing foods reported on intake²⁴

Missing Food	Frequency
Jollof rice	59
Fufu	53
Egusi soup	31
Tomatoes stew (Beef)	29
Eba/Garri	24
Okro soup/stew	22
Groundnut soup	15
Malt/Malta guiness	15
Moi Moi	14
Goat meat	14
Tomatoes egg sauce	14
Vegetable soup/Efo riro	11
Poundo yam	10
Pap/Akamu	10
Chin chin	9
Pepper soup (one pot)	9
Yam pottage	9
Rice and beans/Waakye	8
Fried yam	8
Akara/Bean balls	8
Tilapia fish	8
Ndole sauce	7
Beans porridge	6
Semolina/Semovita	6
Amala	5
Plantain chips	5
Oha soup	5
Shito sauce	4
Tomatoes stew (fish)	4
Dried fish	4
Banku	4

Eru soup	3
Puff puff	3
Light soup	3
Bitter leaf soup	3
Kenkey	2
Kuli Kuli	1
Afang soup	1
Dried snail	1
Bean soup	1
Ewedu soup	1
Zobo drink	1
Ofe Nsala soup	1
Kondre	1
Catfish	1
Maize meal (Sadza/Isitshwala)	1
Cow leg	1

Appendix 13: Recruitment poster



Are you a Black African woman from sub-Saharan Africa who is overweight or obese and living in London?

Share your views for a chance to win a £100 amazon voucher ...



THE STUDY

We are interested in assessing dietary patterns of Black African women from sub-Saharan Africa living in the UK and exploring different viewpoints and experiences on healthy eating.

Are you eligible?

- African migrant women from sub-Saharan Africa living in the UK
- 18 years or older
- First or second-generation migrant
- Overweight or obese

Location

- At your convenient time and location

Your involvement: I would ask you to complete a short demographic questionnaire about your background and you will be required to complete questionnaires on the food you eat at 4 different days and intervals. Each session will last only about 30 minutes per time. You can complete these questionnaires at your convenient time, online or physically.

You stand a chance to win a £100 amazon voucher in a prize draw!!

If you are interested in participating in this study, please contact
2113414@live.stmarys.ac.uk
Itse Olaoye.



St Mary's
University
Twickenham
London

Appendix 14: Ethical approval for the BALANCED Webinar

23/12/2024

Ethics ID_Code: SMU_ETHICS_2024-25_861

RE: A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women

(The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change

Dear Itse

This letter is to verify that the above titled project is granted ethical approval by the Faculty on

behalf of the St. Mary's University Ethics Subcommittee.

Approval is given for completion within the stated time period. If your project does not commence or is not completed within the given time period, please contact a faculty representative to the Faculty (STHS) Ethics Committee to ensure that you can continue without resubmitting your application. In addition, any serious adverse events that arise from this study or significant changes that occur in connection with this study that may alter its ethical consideration must be reported to the Faculty Ethics Committee immediately and may require reconsideration of your application.

Approval is given on the understanding that the Ethical Guidelines for Research are adhered to (see the University webpage: Research at St. Mary's). If you have any further questions or need further information, please do not hesitate to get in touch with me.

Yours sincerely,

M.Hobson

Faculty of STHS Ethics Committee

Appendix 15: PARTICIPANTS CONSENT FORM

Name of Participant: _____

Title of the project: A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women (The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change

Principal investigator and contact details: Itse Olaoye, 2113414@live.stmarys.ac.uk

Members of the research team: Associate Prof Nicola Brown, Dr Kyriaki Myrissa, Dr Eirini Kelaiditi, Dr Fotini Tsofliou

1. I agree to take part in the above research. I have read the Participant Information Sheet which is attached to this form. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.
2. I understand that I am free to withdraw from the research at any time, for any reason and without prejudice.
3. I have been informed that the confidentiality of the information I provide will be safeguarded.
4. I am free to ask any questions at any time before and during the study.
5. I have been provided with a copy of this form and the Participant Information Sheet.

Data Protection: I agree to the University processing personal data which I have supplied. I agree to the processing of such data for any purposes connected with the Research Project as outlined to me.

Name of participant (print).....

Signed.....

Date.....

--

If you wish to withdraw from the research, please contact the principal investigator on the contact details above [or leave a telephone message on 02082402321].

Appendix 16: PARTICIPANT INFORMATION SHEET FOR WEBINAR

Title of project

A Theory and Evidence-Based Intervention for Overweight and Obese Black African Women (The BALANCED Program): Integrating Co-Design with the COM-B Model and Behaviour Change

Purpose and value of study

This study aims to assess the feasibility and practicality of the BALANCED (Black African Lifestyle and Nutrition Change for Empowerment and Development) intervention, a culturally tailored program designed to improve dietary behaviours among Black African women in the UK. Your input will help refine the intervention and ensure it is culturally relevant and implementable in real-world settings.

Who can take part in this study?

Health practitioners, including psychologists, counsellors, nutritionists, dietitians, and public health commissioners with experience working with diverse populations in the UK.

Do I have to take part?

No, participation is entirely voluntary. You are free to withdraw from the study at any time without any consequences.

What will happen to me if I take part in the study?

If you agree to participate, you will attend a 45-minute webinar where the BALANCED intervention will be presented. You will then provide feedback on its feasibility and practicality. After the webinar, you may be asked to complete a short follow-up questionnaire.

How much time they will need to give up to take part in the project?

The total time commitment is approximately 1 hour: 45 minutes for the webinar and about 10-15 minutes to complete the follow-up questionnaire.

What are the possible benefits of taking part?

By participating, you will have the opportunity to contribute to the development of a culturally relevant health intervention, enhancing your professional knowledge. Your feedback may also help improve public health strategies targeting minority populations.

What are the possible disadvantages and risks of taking part?

There are no significant risks associated with this study. However, some participants may feel minor discomfort when providing feedback, though this will be managed in a supportive and respectful environment.

Who is organising the research?

The research is being conducted by Itse Olaoye, a PhD researcher at St Mary's University.

What will happen to the results of the study?

The results of the study will be used to refine the BALANCED intervention and may be published in academic journals or presented at conferences. The findings will also contribute to the development of health interventions for Black African women in the UK.

What will happen to any information/data collected from you?

All data will be anonymised to ensure your confidentiality. It will be securely stored on St Mary's University servers and only accessible to the research team. The data will be kept for up to 10 years, in accordance with research best practices.

Contact details for further information

If you are interested in participating in the study, or would like to receive further information about the study, please contact the main investigator using the contact details below:

Researcher: Itse Olaoye, E-mail: 2113414@live.stmarys.ac.uk

Please note that you will be given a copy of this information sheet to keep together with a copy of your consent form

Appendix 17: Presentation Outline: Overview of the BALANCED Programme

1. Introduction (2 minutes)

- Welcome and introduction of the researcher
- Brief explanation of the purpose of the webinar
- Outline of the session structure

2. Background and Rationale (5 minutes)

- Overview of the problem: obesity and poor dietary patterns among Black African women in the UK
- Key findings from previous studies in the PhD program highlighting socio-cultural and environmental influences
- The gap in culturally tailored interventions for this population

3. The BALANCED Programme: Concept and Development (8 minutes)

- Programme Objectives:
 - Promote healthier dietary behaviours
 - Address socio-cultural and environmental barriers
- Development Process:
 - Theoretical frameworks: Behaviour Change Wheel and COM-B model
 - Co-design process with Black African women
 - Integration of key findings from previous studies

4. Programme Structure and Components (10 minutes)

- Intervention Components:
 - Educational modules (dietary guidance, culturally tailored)
 - Peer support sessions
 - Individual counselling with motivational interviewing
- Delivery Format:
 - Modes of delivery: community-based sessions, online sessions, peer groups
 - Duration and frequency of sessions

5. Practitioner Involvement and Feedback (5 minutes)

- Role of practitioners in refining the intervention
- Importance of practitioner feedback for feasibility and practicality assessment
- Invitation to share insights during Q&A and follow-up survey

6. Q&A Session (5-7 minutes)

- Open floor for practitioner questions and feedback
- Focus on feasibility, cultural relevance, and practical delivery

7. Conclusion and Next Steps (2 minutes)

- Summary of key points
- Explanation of the next steps in the research process
- Thank participants and provide contact details for follow-up

Appendix 18: FOLLOW UP QUESTIONNAIRE (BALANCED WEBINAR)

DEMOGRAPHIC QUESTIONS:

1. Professional background:
What is your current role (e.g., psychologist, counsellor, GP, nutritionist, dietitian, commissioner)?
2. Years of experience:
How many years of experience do you have in your field?
3. Work setting:
In which type of organisation do you currently work (e.g., NHS, community health service, private practice)?
4. Service area:
What region or local authority do you work in?
5. How do you identify your ethnicity? (Optional)
6. Have you ever engaged with this population?
 - ☐ Yes (direct contact with this population)
 - ☐ Yes (indirectly i.e. my work would have implications for this group)
 - ☐ No
7. What (if any) challenges/barriers did you encounter while working with/for this group?

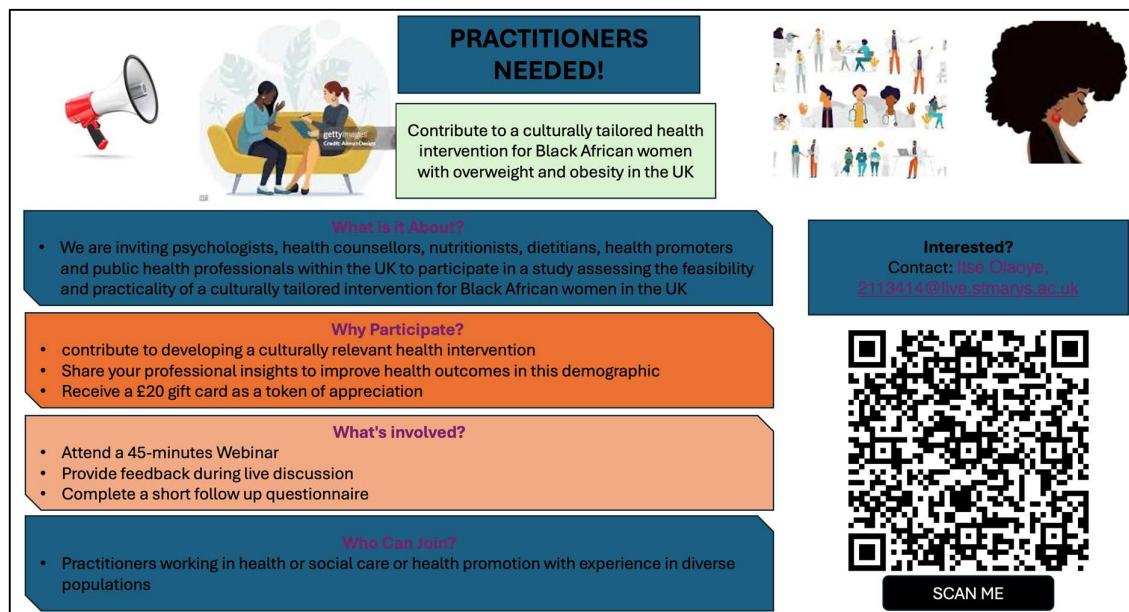
PROGRAM QUESTIONS:

8. Feasibility of Implementation:
How feasible do you think it is to implement the BALANCED intervention in a real-world setting, such as NHS or community health services? What challenges might arise, and how could they be addressed?
9. Cultural Relevance:
Do you believe the intervention is culturally appropriate for Black African women in the UK?
Are there aspects of the intervention that could be made more culturally relevant or sensitive?
10. Practicality of Delivery:
In your opinion, is the intervention's delivery format (e.g., modules, peer support) practical for this population?
11. Please provide any recommendations for the proposed intervention

Email Address _____

Thank you very much for taking the time to participate and complete this questionnaire!

Appendix 19: Participant recruitment poster for BALANCED webinar



PRACTITIONERS NEEDED!

Contribute to a culturally tailored health intervention for Black African women with overweight and obesity in the UK

What is it About?

- We are inviting psychologists, health counsellors, nutritionists, dietitians, health promoters and public health professionals within the UK to participate in a study assessing the feasibility and practicality of a culturally tailored intervention for Black African women in the UK

Why Participate?

- contribute to developing a culturally relevant health intervention
- Share your professional insights to improve health outcomes in this demographic
- Receive a £20 gift card as a token of appreciation

What's involved?

- Attend a 45-minutes Webinar
- Provide feedback during live discussion
- Complete a short follow up questionnaire

Who Can Join?

- Practitioners working in health or social care or health promotion with experience in diverse populations

Interested?
Contact: rose.ckanye@london.ac.uk
01124141414



SCAN ME