Health behaviours and childhood obesity among refugee families with young children

A thesis submitted to the University of Manchester for the degree of Doctor of Philosophy in the Faculty of Biology, Medicine and Health.

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Abbreviations

BCT=Behaviour change technique

BCW=Behaviour change wheel

BMI=Body Mass Index

COM-B= Capability, Opportunity, Motivation –Behaviour

PPI=Patient and public involvement

TA=Thematic Analysis

TDF=Theoretical Domains Framework

TFA=Theoretical Framework of Acceptability

UK=United Kingdom

WHO=World Health Organisation

Thesis abstract

Introduction:

Childhood obesity represents a leading public health issue over the last decade, with a progressive rise reported in the prevalence of obesity among children living in low socioeconomic status in developing countries as well as groups of ethnic minorities. A high prevalence of obesity is also reported amongst refugee children who move to developed countries, where they often live in low income families. Poor health consequences associated with childhood obesity, include hypertension, insulin resistance, orthopaedic problems, and low quality of life. Refugees and their families commonly face complex physical and psychological challenges, exacerbated by their low income status, after resettlement in a new environment, which can undermine their health and put them at higher risk of being overweight or obese.

Every year there are increased numbers of refugee families resettled in developed countries. This posing a very serious challenge to the governments of host countries, especially as these vulnerable populations face challenges that can affect their health, there is still a noticeable lack of research on refugee children health behaviours and obesity. To address this health issue, it is essential to understand the challenges they face and how they affect their obesity-related behaviours. In particular, it is essential to identify the key factors related to health behaviours and childhood obesity among refugee children. This would inform the development of a culturally informed weight management intervention that supports appropriate nutrition and the prevention of obesity and associated disease in this population.

Objectives: The overall aim of this thesis was to understand the factors influencing obesity behaviours in refugee children settled in developed countries, and to develop a theoretically informed intervention to address key health behaviours that impact on refugee children obesity.

Methods:

These research objectives were addressed through a series of four studies. Firstly, a systematic review that synthesised the literature to identify the factors that influence health behaviours related to obesity in refugee families with young children after their resettlement in the developed countries. The second was a qualitative study (N=27), that built on the review, to investigate refugee parents' experiences and perspectives regarding the health behaviour

changes (i.e. changes in diet, levels of physical activity) of their young children. The third study developed an intervention (Be healthy) informed by the Behaviour Change Wheel and based on findings from the first two studies, as well as Public patients involvements (PPI) and stakeholder involvement. The final study (N=23), that aimed to refine the intervention through assessing its acceptability to the targeted population.

Findings:

The data synthesis process revealed, several factors that influence the health behaviours of children. Several factors contributed to unhealthy food choices, including poor food literacy, increasing availability of unhealthy foods, and decreasing availability of healthy foods. There were multiple factors linked to overconsumption of food, including temptation from increased variety and abundance of food that is greater than in their home countries, as well as reacting to previous food insecurity by overeating while food was available. There were several factors related directly to physical activity, including poor weather, labour saving devices, and lack of value given to sporting activities. The review also revealed the parental practices that influence the health behaviours of children, especially those aged 2 to 10 years. The results suggested a need to understand further the role that parents have in influencing the health behaviours and weight trajectories of children following resettlement.

Finding from qualitative interviews revealed that parents face substantial changes to their lifestyle and personal context, including restricted living space, restricted neighbourhood/community and inclement weather. These environmental differences required parents to adjust their roles and practices around their own and their children’s eating habits. These changes influenced refugee children’s health behaviours. Of particular concern to parents were increased sedentary behaviour and consumption of unhealthy snacks. Parent's beliefs about relevant health behaviours included cultural beliefs regarding body shape, perception that the new environment is restricted and unsafe and issues with knowledge about and trust in, the food in the host country. These beliefs have influenced the parents and their children’s diet and level of physical activity, shaping the ways that they interact with their new living environment. These findings suggest targeting these behaviours in tailored interventions may improve the health of refugee children.

Using the COM-B model and Theoretical Domains Framework to guide the behavioural diagnosis, findings suggested that behaviour changes should be targeted at Psychological

Capability, Physical Opportunity, Reflective Motivation and Social Opportunity. This resulted in the design of a four-week family-based intervention, "Be healthy", that targeted snacking and sedentary behaviours. The final study found that the intervention was acceptable. Parents had a positive attitude towards attendance and perceived that the programme was effective in motivating and initiating behaviour change. Suggested changes to further refine the "Be healthy" intervention that more positive experiences and solutions be shared, more photos be included in the booklet to enhance accessibility, and improvements be made to the referral process in order to make potential participants more aware of the level of difficulty.

Conclusion:

Children in refugee families are at risk of increased sedentariness and unhealthy snacking post-settlement. An intervention targeted at parents that takes into account their complex and unique challenges, as well as their cultural background, is acceptable. Future research should determine the effectiveness of "Be healthy" within this setting using a randomised controlled trial, with feasibility studies being required to determine its transferability to other contexts.

Declaration

There is no portion of the work in the thesis that supports an application for any other degree or qualification at this university or any other institute.

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Rationale for submitting the thesis in journal format

As a result of the linear nature of the research conducted during this PhD, including systematic reviews, intervention designs, and acceptability studies. During the PhD period, two of the studies were accepted for publication, and two were preparing to be submitted. It was therefore appropriate to utilise a journal format for this thesis. The format of the papers have been rearranged for the purpose of this thesis, with the figures and tables been renumbered and placed within the main body of the text.

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The Author

The author of this thesis has a degree in Psychology (BSc) and Masters in Health Psychology (MSc). Research on refugees has been part of the author's Masters dissertation, which investigated the same population and was the first research that sparked the author's interest in pursuing this PhD in the same area. During this PhD, the author has contributed to the following publications. Below list of publications and presentations related to this research

Papers accepted for publication directly from this PhD programme of research:

Alsubhi, M., Goldthorpe, J., Epton, T., Khanom, S., & Peters, S. (2020). What factors are associated with obesity-related health behaviours among child refugees following resettlement in developed countries? A systematic review and synthesis of qualitative and quantitative evidence. *Obesity Reviews : an official journal of the International Association for the Study of Obesity, 21*(11), e13058. https://doi.org/10.1111/obr.13058

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Alsubhi, **M**., Goldthorpe, J., Epton, T., Khanom, S., & Peters, S. What factors are associated with obesity-related health behaviours among child refugees following resettlement in developed countries? A systematic review and synthesis of qualitative and quantitative

evidence. British Psychological Society's Division of Health Psychology Conference, Manchester, July 2019 (oral presentation).

Alsubhi, **M**., Goldthorpe, J., Epton, T., Khanom, S., & Peters, S. What factors are associated with obesity-related health behaviours among child refugees following resettlement in developed countries? A systematic review and synthesis of qualitative and quantitative evidence. European Health Psychology Society Conference, Dubrovnik, September 2019. (Oral presentation).

Alsubhi, M., Goldthorpe, J., Epton, T., Khanom, S., & Peters, S. What factors are associated with obesity-related health behaviours among child refugees following resettlement in developed countries? A systematic review and synthesis of qualitative and quantitative evidence. University of Manchester's Centre for Health Psychology Seminar Series, Manchester, May 2019 (oral presentation).

Alsubhi, M., Epton, T., Goldthorpe, J., & Peters, S. A qualitative investigation of the health behaviours of young children from refugee families using photo elicitation interviews. University of Manchester's Centre for Health Psychology Seminar Series, Manchester, May 2020. (Oral presentation).

Alsubhi, M., Epton, T., Goldthorpe, J., & Peters, S. A qualitative investigation of the health behaviours of young children from refugee families using photo elicitation interviews. British Psychological Society's Division of Health Psychology Conference. June 2021. (Oral presentation).

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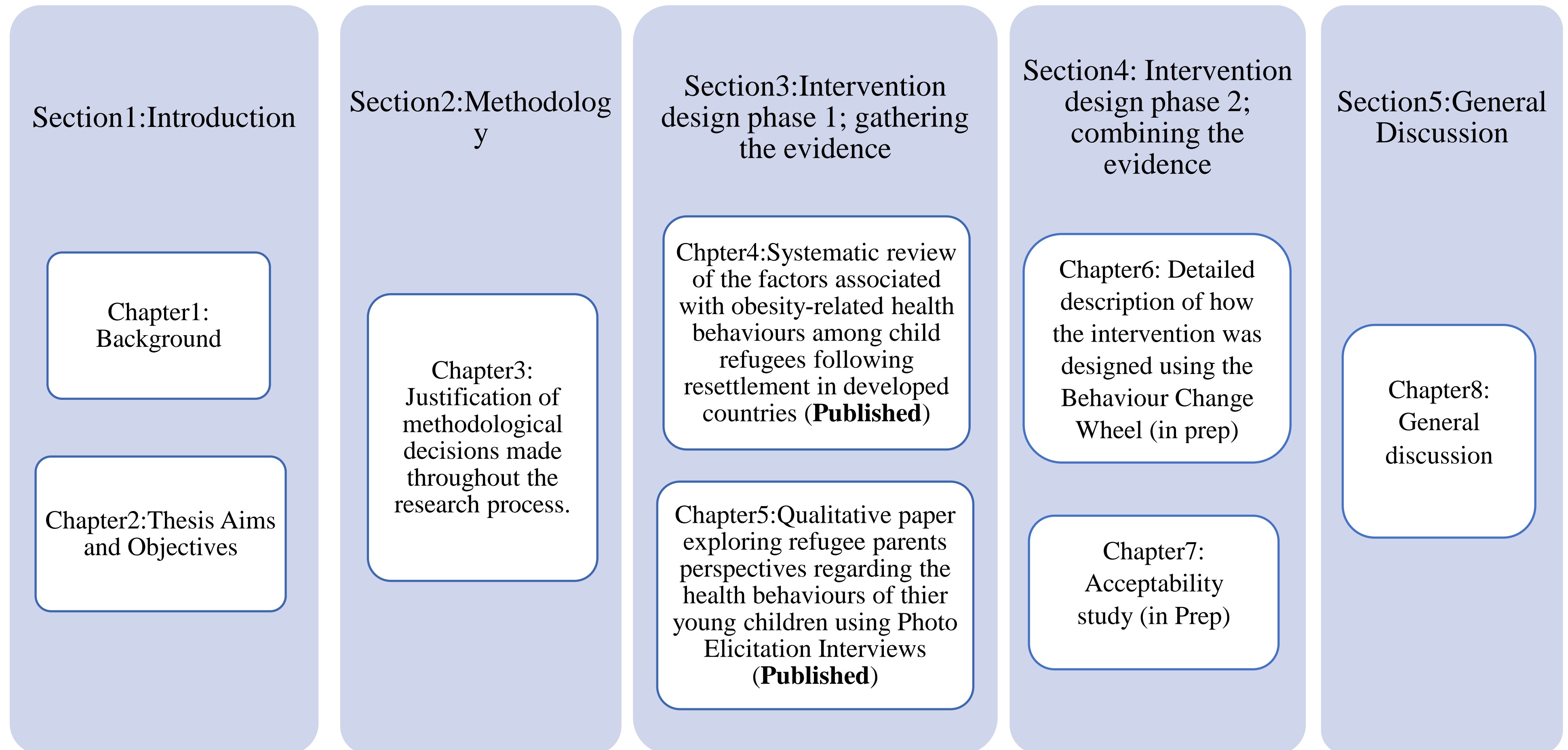
Figure 1.1 Overview of thesis structure



Chapter 1. Introduction

Chapter Overview

This chapter presents literature and current debates relating to the main topics in this thesis, including childhood obesity and related health behaviours among refugee families resettled in developed countries, as well as outlining key concepts and terms essential to this empirical work. This chapter also provides an overview of the literature on overweight and obesity in refugee populations, focusing on childhood obesity. I start with definitions of overweight and obesity among children, then examines the global prevalence of childhood obesity in both developed and developing countries, and finally focuses on the incidence of childhood obesity in refugee populations. In addition, it will highlight the challenges inherent in forced migration and explore the underlying effects of these challenges on the health of refugees. The section then focuses on the physical and psychological consequences of childhood obesity among refugee populations. Finally, the interventions targeting refugee populations are discussed and the limitations in the existing literature highlighted.

1.1 Introduction to the main topics in the research

Childhood obesity has been increasing in prevalence globally over the last decade and constitutes a significant public health issue in the 21st century (Sahoo et al., 2015). This issue affects children worldwide, with higher overall rates among developed countries, causing concern at both government and public levels (Popkin, 2010). Childhood obesity/overweight has been linked with many adverse health implications such as type II diabetes, hypertension, dyslipidemia, orthopaedic problems, and poor quality of life in both the long and short term (Freedman et al., 2007; Pinhas-Hamiel & Zeitler, 2007; Taylor, 2006). This problematic trend has been recognised as particularly prevalent among refugee children, increasing after their resettlement in developed countries. After resettlement in a new environment, this population faces complex physical and psychological challenges, which can significantly influence obesity-related behaviours. During their transition to developed countries, these vulnerable populations face many challenges, such as language barriers, interacting with new food environments, and subsequently affecting their health behaviours. This means that they are more vulnerable to becoming overweight and obese (Harkensee & Andrew, 2021; Kumar et al., 2021; Lane et al., 2018). Developing obesity and its consequences can exacerbate these

existing challenges. Early intervention through tackling childhood obesity and targeting health behaviours is therefore essential (Amstutz et al., 2020).

1.2 Childhood obesity and overweight

The primary purpose of overweight and obesity definitions is to clinically describe individuals with excess fat on their bodies. Both terms typically denote the "abnormal or excessive fat accumulation that may impair health" (WHO, 2018a, p. 176). While adipose tissue is an important part of the body structure that is essential for life, excessive increases or decreases in individual body fat can have many negative health implications. Therefore, diagnoses of body fat can be used to measure increased risk of certain health complications (Craig, 2013).

The most common method used in the measurement of obesity is body mass index (BMI). This is a simple system, based upon the classification of weight-for-height, but is the most utilised proxy measurement for assessing levels of body fat. Internationally, adults (age ≥ 18 years) are classified as being overweight at $\geq 25kg/m^2$ and obese at $\geq 30kg/m^2$ (Chen & Wang, 2010; WHO, 2004). However, the use of adult BMI categories is not necessarily applicable or appropriate to determine childhood obesity, given that young people go through stages of rapid growth and can differ widely in their levels of development (WHO, 2018a). Additionally, it is important to note that the body composition of children typically varies with age and between boys and girls (Rusek et al., 2021). Therefore, childhood overweight and obesity are defined differently in the literature, reflecting the unresolved nature of this problem (Rusek et al., 2021). This necessitates defining new BMI cut-off points in response to these factors (Craig, 2013). The discontinuity between childhood and adulthood obesity and overweight definitions is addressed in the WHO's 2007 growth reference data (Onis et al., 2007). The WHO child growth standards have been found to be an effective, reliable tool to monitor rapid change in weight among children, providing measurements that were age and sex-specific; obesity and overweight were defined as above the 97.7^{th} and 84.1^{st} percentiles of the BMI distribution, respectively (De Onis et al., 2007; Onis et al., 2007).

1.3 Prevalence of childhood obesity

1.3.1 Worldwide

Childhood obesity is widely considered to be a major public health issue facing government and policymakers worldwide (Di Cesare et al., 2019a; Karnik & Kanekar, 2012). The last decade has seen a marked and alarming rise in the global prevalence of obesity and overweight

among children (Di Cesare et al., 2019b; Lobstein et al., 2015), with the WHO reporting that significantly numbers of children under the age of 5 were overweight or obese in 2020 (WHO, 2021). According to recent data in 2020, approximately 39 million children under the age of five in the world were overweight or obese, the majority of whom live in developing countries (Gupta et al., 2012; WHO, 2021). It is noteworthy, that in the most recent estimates of trends in overweight in low- and middle-income United Nations regions, overweight prevalence increased modestly from 4.8% in 1990 to 5.9% in 2018 (Di Cesare et al., 2019a). Some studies have suggested that the rise in childhood obesity has slowed appreciably and even plateaued(Olds et al., 2011; Stamatakis et al., 2010). That view was supported by recent studies that concluded that many European countries have implemented successful policies and interventions to combat the rise in overweight and obesity (Buoncristiano et al., 2021). However, the overall prevalence of obesity and overweight among children is still considered higher than ever (Rokholm et al., 2010). That is also was echoed by a recent study that highlighted that despite the decrease in the overall rate in some European countries, overweight and obesity remain high, and there are considerable differences between countries and socioeconomic groups (Buoncristiano et al., 2021) To sum up, there were efforts from some countries to contain the global trend of childhood obesity, however, there is still much to be done.

1.3.2 Obesity levels in developed and developing countries

The increased prevalence of childhood obesity has been observed in most parts of the world. According to the World Economic Situation and Prospects (WESP) globally, all countries are classified into three broad categories: developed economies, economies in transition, and developing economies. However, recent studies have noted a higher prevalence of childhood obesity particularly among developed countries , such as the USA, where approximately 19.7% of children were considered overweight/obese (Vazquez & Cubbin, 2020). This section will compare the prevalence of childhood obesity in developed and developing countries.

The prevalence of increasing overweight and obesity among children and adolescents has recently been reported in several developing countries, and the trend is expected to continue (Gupta et al., 2012). According to a recent report (WHO, 2018a), almost 50% of overweight and obese children aged under five were living in Asia (Abarca-Gómez et al., 2017). This finding was supported by systematic analyses of surveys, reports, and published data on childhood obesity trends, which identified increased obesity among children in developing

countries, particularly: “41.8% in Mexico, 22.1% in Brazil, 22.0% in India” (Gupta et al., 2012, p. 48; Ng et al., 2014). Although the majority of overweight or obese children live in developing countries, an alarming proportion can still be found in developed countries. The increase in obesity is most pronounced in economically developed countries, especially in North America and Europe (Caballero, 2007). In the USA, the rates of childhood obesity have tripled since 1970, with recent data showing that obesity prevalence among children and adolescents aged between 2 and 19 was 19.7% , affecting about 14.7 million individuals. From the report, obesity was more prevalent among primary school aged 6- to 11-year-old children with 20.7%, compared with kids aged 2- to 5-years-old with 12.7%(Stierman et al., 2021). A similar rise has been recorded in the UK, with the most recent data showing a significant increase in obesity rates among primary-aged children (NHS, 2021b). According to the 2020-21 report released recently from the National Child Measurement Programme, England, obesity prevalence among four- and five-year-olds in reception classes has risen from 9.9% in 2019-20 to 14.4% in 2020-21 (NHS, 2021a). However, it is important to acknowledge that the increase in obesity is not the same across all groups in England, it is higher in certain populations as it varies according to deprivation indices and ethnicity. For example, the obesity rate among children living in England's most deprived areas is substantially higher. In 2021/22, 6.2% of reception (ages 4-5) children in the least deprived areas were obese, compared with 13.6% in the most deprived (NHS, 2021a). In addition, obesity rates are higher in some ethnic minority groups (particularly among children of black or Bangladeshi descent, although this varies by age and sex of the child) (NHS, 2021a).

1.3.3 Obesity and health inequalities

It is known that health is affected by a variety of factors, which can be understood within the commonly cited Dahlgren and Whitehead (1993) model (see Figure 1.2) (Dahlgren & Whitehead, 2006). The concept of health inequalities refers to observed differences in health status between groups. The categories are based on gender, ethnicity, sexuality, and social class (Kawachi et al., 2002), as well as place of residence, race, culture, religion, age, occupation, income, and other socioeconomic factors (White et al., 2009). There are several factors involved in the development and persistence of obesity in childhood. Socioeconomic status (SES) has a significant effect on the prevalence and effects of multiple risk factors. There is a social gradient of health inequity, where people of lower socioeconomic status die sooner and have poorer health than their more affluent counterparts (Mackenbach et al.,

2008). This is supported by recent review of all the relevant policies in several countries and international organisation such as the World Health Organization (WHO), the European Union (EU), where they concluded that childhood obesity has a social gradient related to it (Vallgårda, 2018; Vazquez & Cubbin, 2020). It is important to note, however, that the relationship between SES and childhood obesity differs from country to country, based on the country's socioeconomic status (e.g., high, middle, or low income), as defined by The World Bank (Vazquez & Cubbin, 2020).

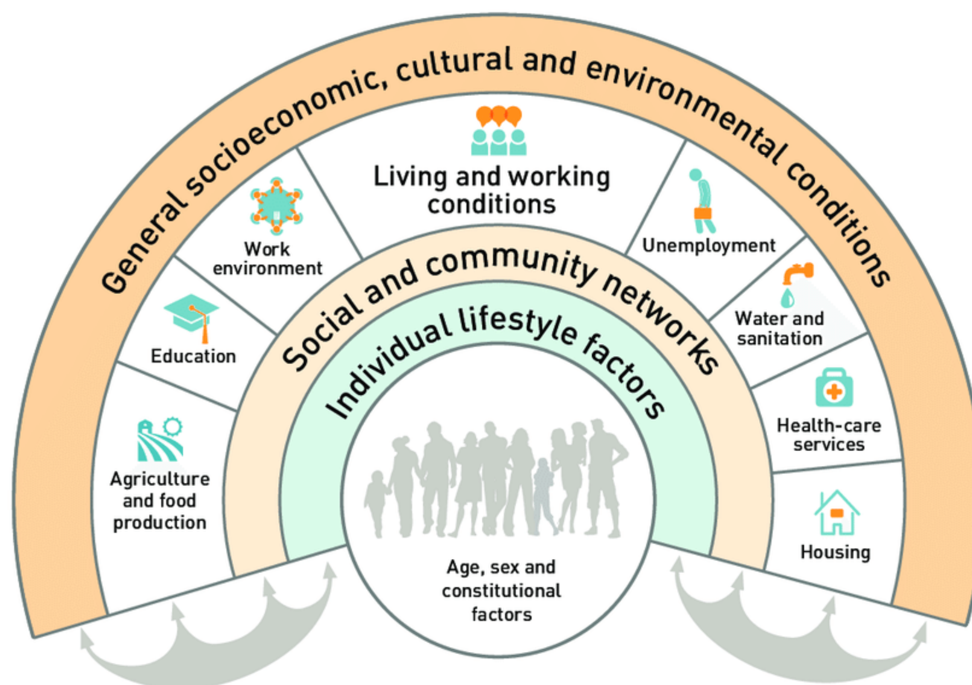


Figure 1.2. The main determinants of health (Dahlgren & Whitehead, 1993)

It is worth noting that in the literature, clear differences can be seen in the relationship between socioeconomic status (SES) and the risk of developing child obesity. This was strongly supported by recent review that highlighted that more affluent countries have found an inverse relationship between SES and childhood obesity, while poorer countries have found a positive relationship (Vazquez & Cubbin, 2020). In their review they highlighted that the relationship between SES and childhood obesity may be mediated by additional mechanisms. For example, families with lower SES may purchase more energy dense foods (i.e., fast foods) because they are cheaper and convenient to purchase. In addition, there is a high risk of overweight/obesity among low-income children in the United States, and previous studies have identified an important association between socioeconomic status and weight outcomes (Ogden et al., 2010;

Wu et al., 2015). In contrast, childhood obesity in developing countries is strongly associated with higher socioeconomic status. A systematic review into the association between obesity and SES in developing countries reported a positive association, with a higher risk of obesity relating to higher SES (Chung et al., 2016; Dinsa et al., 2012; Frederick et al., 2014). This association was explored in a recent review of the literature, which concluded that children with lower SES are more likely to become obese in high-income countries, and middle-income countries may follow, but the opposite may be true in low-income countries (Stierman et al., 2021).

Another association has been observed in the literature between childhood obesity and being from certain racial and/or ethnic minorities. For example, in the USA, the prevalence of obesity among Hispanic children was 26.2%, 24.8% among non-Hispanic Black children, 16.6% among non-Hispanic White children, and 9.0% among non-Hispanic Asian children (Stierman et al., 2021). Similarly, in the UK, obesity rates are higher in some ethnic minority groups of children, especially among Black and Bangladeshi children, although this varies by age and gender (OHID, 2021). This is particularly pronounced among the children from migrant and refugees' families, who are at even higher risk than non-migrant ethnic minority children. Possibly, this is due to the fact that these populations tend to live in lower SES countries after resettling there. Nevertheless, it is important to differentiate between different types of immigrants because they might encounter different challenges that may impact their chances of developing obesity.

Immigration is an umbrella term that involves many countries of origin, meaning that it is problematic to treat immigrants as a homogenous group. Given that these groups migrate for different reasons, they can be affected by profoundly different variables. Therefore, it is necessary to distinguish between refugees who are forced to leave their home countries (refugees) and those who are economic immigrants (Cortes, 2004). Since refugee families represent a vulnerable population in developed countries, it is perhaps even more concerning that childhood obesity has affected many refugee children resettling in western developed countries (Mulugeta et al., 2018). The challenges experienced during forced migration seem to make refugee children more vulnerable to overweight and obesity than the local population of their host country (Gadd et al., 2005; Patil et al., 2010). The section below will discuss the prevalence of this trend among refugee children.

1.3.4 Prevalence of childhood obesity in refugee children

The migration from developing countries to developed countries is especially associated with many challenges that can affect refugee health behaviours and associated weight gain, leading to a correspondingly greater risk of obesity and obesity-related chronic diseases in the long term. It has been reported that obesity rates have recently risen, particularly among refugee children settled in developed countries (Kumar et al., 2021).

According to the literature, there has been a noticeable increase in the rates of overweight and obesity among refugee children settling in developed countries like the USA, the UK, Australia and Canada. A recent review into the long-term physical health outcome of refugees resettling in the USA found that overweight and obesity among refugee children increased post-resettlement in the USA, from 9 -17% at arrival compared with 21 - 35% several years post-resettlement (Kumar et al., 2021). They specify that in general there were more increases in overweight than obesity, with overweight estimated to be between 14 and 18% at baseline, and between 23 and 31% several years post-resettlement. Obesity baseline estimates ranged from 0–7%, and went up to 13–18% several years post-resettlement (Kumar et al., 2021). This review highlighted certain limitations in the studies that focused on overweight and obesity among refugees. They found that considerably small numbers of studies focused specifically on refugees, sometimes referring to participants as immigrants or foreign-born populations, which might not necessarily reflect the true situation experienced by refugees. There was also a relative paucity of data focused on refugee children, combined with the limited ability of some studies to follow these children and explore the long-term implications of resettling in the USA (Kumar et al., 2021). Furthermore, earlier studies attempting to quantify this significant increase in obesity and overweight have tended to be limited by small size and convenience samples, focusing on refugee children from a single country of origin, limiting the transferability of findings to populations from other countries of origin (Dawson-Hahn et al., 2016b; Heney et al., 2015).

Similar observations have been made in Australia, with an early study in Victoria noting that a significant increase in the rates of overweight and obesity among refugee children, observed prevalence of overweight and obesity among children in this study is comparable to that reported among Australian children (Renzaho et al., 2006a). It has been estimated that the rate of childhood obesity in Australia is rising by one percentage point a year. Therefore, it was not surprising that these refugee children recorded a high overweight/obesity prevalence over a

short period of time (Renzaho et al., 2006a). Another study found that obesity is a significant health issue for refugee children from sub-Saharan African resettling in Australia, with intergenerational differences in parenting beliefs, the functioning of the family, health literacy, and lifestyle all contributing to obesity development (Renzaho et al., 2015a).This situation is mirrored in Canada, which has experienced a rapid increase in the prevalence of childhood obesity among refugees. According to an investigation into weight gain trends and risk factors in paediatric refugee populations in Canada, refugee children who have lived in Canada for 1.5 to 9 years demonstrated a prevalence of obesity that ranged from 1.4 to 21%. In addition, the BMI increase among refugee children and youth was steeper than that among non-refugees ($P < 0.001$) (Amirazodi et al., 2018).

The situation in the UK is similar, with a clear increase in the prevalence of overweight and obesity among refugee children, with a recent review finding that the percentage of overweight and obesity among refugee children was 41% (Harkensee & Andrew, 2021). All the studies were more focused on quantifying the prevalence therefore there is a gap in the literature around understanding the risk factors and developing interventions to reduce the influence of these factors on obesity development. The topic of refugee health in other developed countries has not been given sufficient focus in the literature. Therefore, further research should be undertaken in those nations that host refugees, in order to develop a better understanding of the health challenges facing this vulnerable population, enabling better management of the specific combination of problems that they face.

In an attempt to explain the reasons contributing to this increasing trend in obesity, several early studies have offered possible causes in their discussions of immigrant populations (Heney et al., 2015; Mulugeta et al., 2018; Olson et al., 2017). However, given that refugees are recognised as having related, but different challenges than economic immigrants, it is important to investigate the reasons for weight gain in this population.

1.4 The experience of forced migration and its effect on the health of refugees

Every year, millions of people around the world are forced to leave their home countries in response to the threat of international hostility, civil war and violence (Andrade & Doolin, 2016). A refugee is defined as an individual "who is unable or unwilling to return to his or her country of nationality because of persecution or a well-founded fear of persecution on account of race, religion, nationality, membership in a particular social group, or political opinion"

(Mossaad & Baugh, 2016, p. 1). By the end of 2021, 89.3 million people had been forcibly displaced from their homes worldwide, of which an estimated 36.5 million (41%) are children under the age of 18 (UNHCR, 2022). Approximately 27.1 million refugees who sought protection abroad moved from low-income countries to wealthier nations, such as the USA, Canada, Australia, the UK and a number of other European countries. In 2022, Turkey hosted the most refugees worldwide (UNHCR, 2022). This trend of increased global migration poses many complex and diverse issues for refugees and the states that receive them.

Forced migration is a life-altering process that often raises numerous social, cultural, economic and psychological challenges for refugees. Refugees and immigrants have to overcome similar obstacles and have therefore been examined together in many studies. However, refugees typically comprise a small proportion of the populations of these studies and, as a consequence, the findings may not necessarily reflect the specific difficulties facing refugees. Given the complexity of these challenges, the shortage of research is particularly pronounced with respect to refugee children (Salami et al., 2021). Therefore, there is a need to understand the influence of these factors in the refugee's context. In addition to these challenges, refugees often experience psychological distress as a result of traumatic events they have experienced before being resettled, such as experiencing abuse or witnessing harm, death or threats to others, as well as experiencing family separation, living in refugee camps, and experiencing periods of food shortage or limited access to essentials such as shelter, food, and water.(Correa-Velez et al., 2015). In addition, during crucial phases of their physical, emotional, social, and cognitive development, refugee children are subjected to atrocities due to conflict-related violence and the hardships associated with flight and resettlement. These situations tend to make refugees particularly vulnerable to other health problems. These difficulties can significantly impact the physical and mental health of refugees and their children, even after their settlement in a host country (Scharpf et al., 2021).

The real and potential health risks associated with forced displacement cannot be ignored, despite the intentions to save lives, preserve well-being, and improve the lives of those affected. Refugee families that have migrated to developed countries often face difficulties in adapting to the new culture. This process of acculturation, which describes the "*processes of cultural change that the individual go through when interacts with others in new culture environment*" (Vander Veen, 2014, p. 18), can be incredibly stressful for refugee families (Phillimore, 2011). Homelessness, compromised health status, separation from family, culture shock, lack of social

support systems, altered roles in families, and trauma associated with forced migration are some of the stresses women and children experience when they are displaced (Hirani & Richter, 2019). Refugee families can have similar negative outcomes arising from relocation to the experiences reported by immigrant families (Ramakrishnan et al., 2018). However, these negative issues may be more profound, especially given the fact that many refugees have been forced to leave their home country or are moving to host nations that have particularly large cultural gaps with their own culture.

It is important to highlight that the literature on immigrants provide some arguments that explain some of the negative health outcomes after resettlement in developed countries. One of the most well-known of which is the healthy immigrant effect. According to this theory, immigrants arrive in a “favourable state of health”, which declines over time and converges with that of their host nations (Agic, 2022; Vang et al., 2015). With time, immigrants and refugees migrating to more affluent societies tend to adopt the cultural characteristics of the most deprived groups in the new country, which is known as acculturation. Acculturation refers to the process of cultural exchange that occurs when two distinct cultures come into contact, resulting in changes to the features of both the migrating and host cultures” (Kwak & Berry, 2001). As a result of acculturation, newcomers take on the habits and lifestyles of the host population, increasing their risk of adverse health outcomes (Cyril et al., 2016; Patil et al., 2009b). Acculturation has been associated with overweight and obesity among adults and children who have migrated from low- and middle-income countries to developed countries (Khanna, 2021; Zulfiqar et al., 2021). This could be explained by the high rates of health inequalities in the high income countries, whereby those with low socioeconomic status tend to have considerably poorer health (Thomson et al., 2018). A key aspect of acculturation involves the adaptation to the new food environment, a complex, multidimensional process known as dietary acculturation, which can be defined as “the process that occurs when members of a migrating group adopt the eating patterns/food choices of their new environment” (Satia-Abouta, 2003).

The impact of migration and, presumably, acculturation on dietary behaviour is likely to have an impact on health. The negative health implications among immigrants associated with dietary acculturation are well recognised in the literature (Elshahat & Moffat, 2020; Kavian et al., 2020; Szaflarski & Bauldry, 2019). For instance, an early review of the health consequences of changes in dietary habits after migration to Europe found a substantial increase in energy

and fat intake, as well as other unhealthy changes to the general diet of immigrants post-migration (Holmboe-Ottesen & Wandel, 2012). This was supported by a recent review that looked more specifically at the dietary practice of Arabic-speaking refugees after their resettlement in western societies and found a significant increase in the consumption of unhealthy food options (Elshahat & Moffat, 2020). The potential impact of these shifts can be especially profound for refugee children, who often have greater exposure than adults to the new host environment and western food through day-care, schools and media advertisements that can shape their food preferences and buying behaviours (Kilbride, 2014; Patil et al., 2010; Salami et al., 2021). However, it is important to note that the process of dietary acculturation results in both healthy and less healthy dietary changes, depending on a number of factors, with some studies providing many examples of positive dietary practices due to dietary acculturation (Lesser et al., 2014). One of the main criticisms of acculturation in the literature of immigrants' health is the focus on reporting the negative health disparities in refugee populations, with no coherent explanation of the wider situation or deep understanding of the factors that influence them. While there are several theories that can describe how migrants develop overweight and obesity, the extant literature primarily focuses on acculturation. However, many researchers suggest that the poor health outcomes affecting this population can also be explained in terms of other important factors, such as social contexts, neighbourhoods, and discrimination (Lopez-Class et al., 2011; Viruell-Fuentes, 2011; Viruell-Fuentes et al., 2012).

Recently researchers have argued that these additional sociocultural factors and environmental factors, such as "*new food environment, identity threat, family dynamics, cultural beliefs, socioeconomic position*", provide useful insights into the changes in food consumed and levels of physical activity that occur among immigrants and refugees (Davidson et al., 2004; Delavari et al., 2013; Renzaho, 2004; Sastre & Haldeman, 2015; Tiedje et al., 2014, p. 2). Another migration-related stressor that can affect refugee experiences is the language barrier, as many refugees have initially limited knowledge about the language, location or culture of their host country, which increases the pressure and difficulty of adapting post-resettlement (Gilhooly & Lynn, 2015; McParland, 2014; Salami et al., 2021). Linguistic isolation from the host culture can create stress and anxiety about important interactions, such as community involvement, the ability to access medical services, and employment opportunities, which can have corresponding impacts upon the diet and food intake of refugees in the immediate period after resettlement (Alsubhi, 2017; Pellegrino, 2017). The limited local language skills of some

refugees may also adversely affect their ability to secure employment, resulting in these families continuing to have a low socioeconomic status, with the literature demonstrating a clear association between English language proficiency among refugees and their socioeconomic status (Mock-Muñoz de Luna et al., 2019; Wood et al., 2019). Nutritional health can also be impacted by a lack of familiarity with local foods, differences in available food choices, and difficulties in interacting with and understanding store staff (Dharod et al., 2013; Kavian et al., 2020; Wang et al., 2016).

The low socioeconomic status of refugee families after resettlement in a host country has been found to have a clear association with a negative impact on their nutrition, exacerbated by issues like a lack of time and money to prepare healthy and traditional meals. The need to save money and desire to remain close to others from a similar background also mean that many refugees elect to stay in poorer socioeconomic neighbourhoods which often have more fast food outlets and fewer opportunities to buy fresh food (Pakravan-Charvadeh et al., 2021; Rondinelli et al., 2011; Sastre & Haldeman, 2015). A low income means fewer choices, which leads to unhealthy eating practices such as consuming pre-prepared food and eating calorie-dense foods. (Peterman et al., 2013; Wang et al., 2016). Many refugee parents report that their economic situation informs and shapes their food buying behaviours, due to the fact that they cannot afford to eat their traditional food all of the time due to the difficulty of obtaining it or because it involves fresh fruit and vegetables which are more expensive in developed countries, they can only eat expensive traditional food for the first few days after receiving their monthly income (Patil et al., 2009a). This lifestyle shift and related challenges inherent in migration to developed countries significantly impact the diet and food intake of refugee families, adversely affecting their general health (Anderson et al., 2014).

In summary, relocation to developed countries often involves refugees making significant lifestyle changes. However, the current literature focuses more on the immigrant's experiences than those of refugees and there is clear need for deeper understanding of these factors in the refugee context. There is a need to synthesise the literature to provide deeper understanding on the main factors that influence refugees family with young children, focusing on the impact on their dietary practices and the development of obesity.

1.5 Consequences of childhood obesity among the re-settled refugee population

Obesity is associated with various possible adverse outcomes for children, negatively affecting their physical health, social lives, emotional well-being and academic performance (Sahoo et al., 2015). Being overweight or obese can exacerbate the numerous physical and psychological challenges already facing many refugee children after resettlement in a new environment. The most important of these negative repercussions are discussed below.

There is extensive evidence to suggest that there are common health issues among refugees resettling in developed countries such as the USA, Canada, Australia and the UK. A recent review on the long-term physical health outcomes of refugees resettled in the USA found that refugee adults were more likely to have chronic diseases and were at greater risk for diabetes than non-refugee immigrant adults. Iraqi, Somali, and Bhutanese refugee adults most commonly reported diabetes and hypertension as chronic diseases (Kumar et al., 2021). These health conditions occur more frequently among refugees than other immigrant groups.

1.5.1 Psychological consequences of childhood obesity

There is robust evidence to indicate that childhood obesity is a persistent condition, with many associated psychological consequences that can significantly affect children's social and emotional health. In fact, obesity has been described as being "one of the most stigmatising and least socially acceptable conditions in childhood" (Schwimmer et al., 2003, p. 1818). For example, overweight and obese children often become victims to stigmatisation (Di Pasquale & Celsi, 2017), which is especially problematic given the vulnerability and sensitivity of children to this kind of discrimination and bias, potentially hindering their social, emotional and academic development. A comparison of the quality of life of three groups of children, healthy children, severely obese children, and children who had been diagnosed with cancer, found that many obese children reported comparable levels of self-esteem and quality of life to those who had been diagnosed with cancer, both of whom were noticeably lower than the healthy group (Schwimmer et al., 2003). In the context of this study, the psychological consequences associated with obesity can be aggravated by their forcible displacement to high-income countries, particularly given that large numbers of refugee children have already faced severe psychological stressful experiences linked with the migration.

The negative psychological consequences associated with childhood obesity can be more profound in refugee children, as they may be suffering from many mental health problems

resulting from the adverse events that they experienced post-resettlement and the challenges of the forced migration process. The negative events experienced during their journey to the host country can also have a particularly significant impact on the mental health of these children, resulting in them manifesting a host of mental health problems during the initial post-resettlement period, including post-traumatic stress disorder, depression and anxiety (Fazel, 2018; Fazel et al., 2012). The psychological challenges resulting from whatever conditions necessitated their migration can often be compounded by the experience of adapting to a new environment, with many refugee children experiencing social discrimination and bullying in schools, in addition to negative psychological outcomes, such as low levels of self-esteem and depression. It is therefore essential to obtain a deeper understanding of the risk factors that are strongly associated with developing childhood obesity among this vulnerable population. Among the most widely recognised factors in the literature are health behaviours, such as low levels of physical activity, poor diet and unhealthy eating patterns (Scaglioni et al., 2018; Wickham et al., 2020). Better insight into the social, emotional and environmental factors that are associated with these behaviours is crucial to help this population.

1.6 Health behaviours and the association with developing childhood obesity

Overweight and obesity result from increased energy intake and decreased energy expenditure. This energy imbalance is considered one of the fundamental causes of childhood obesity; however, it is exacerbated by two key modifiable behaviours, namely food consumption and physical activity. Increasing obesity in children has been linked to sedentary behaviour (e.g., watching television, sitting too much), poor diet, and a lack of physical activity. Unhealthy eating, extended TV consumption and other sedentary behaviours are proven to have a strong association with the development of childhood obesity (Jalo et al., 2019). These obesity-related health behaviours in children are recognised as the primary risk factors of childhood obesity, and the effects of the behaviours (i.e. overweight and obesity) considered more commonly among refugee children post-resettlement in western society (Hardy et al., 2017; Scaglioni et al., 2018; Scott et al., 2019).

Refugee children arrives to the host countries with a considerably healthier BMI compared with the children from the host countries(Kumar et al., 2021; Lane et al., 2018). These children usually come from countries and cultures that are healthier than western societies, which has been referred to as “the healthy immigrants effect” (Lane et al., 2018; Millett, 2016). This effect declines with the more time spent by refugees and immigrants in the host country resulting in

a decline in health, for example, children refugees had a steeper increase in their BMI z-score over 12 months than non-refugees(Kumar et al., 2021), this is particularly clear among refugee children, who are more vulnerable to the adoption of new, harmful behaviours (Lane et al., 2018). Although recent research has explored and explained health behaviour changes among immigrants and refugees families, the results of these studies did not focus on refugee families and their unique situation that made them more vulnerable, or they only focused on a specific country of origin (Dawson-Hahn et al., 2020; Salami et al., 2021).

In summary, refugee families face a number of challenges which make them more likely to change health behaviours during their resettlement. This highlights the importance of exploring the literature on the factors associated with these health behaviours in refugee children in order to address this problematic trend which has been neglected in formal research. Therefore, the next section examines the published literature on the interventions targeted for refugee populations and, in so doing, identifies a gap in the literature.

1.7 Interventions that target refugee populations

The increase in obesity and overweight among children is a growing public health concern worldwide, especially with regards to certain vulnerable populations, like refugee children. Many interventions have attempted to tackle the health problems facing refugees resettling in high income countries, based upon an acknowledged need to address the health problems observed in these vulnerable populations. In particular, there is a recognised need for the promotion of ethnically, culturally, and linguistically appropriate health interventions for refugee families and parents, with an emphasis on education and the provision of the information and skills required to promote positive health outcomes (Dawson-Hahn et al., 2016a; Heney et al., 2015; Olson et al., 2017). This section will critically discuss the literature of interventions focused on refugee populations.

Many of the health interventions published on refugees focus on two areas: mental health problems and health inequalities. A particularly large number of studies have been published on interventions to address the mental health problems experienced by refugee families and children (d'Abreu et al., 2019; Fazel & Betancourt, 2018; Graham et al., 2016; Nosè et al., 2017). These interventions have been delivered to refugees in peer, school, and family-based approaches, with a primary focus on the mental health problems resulting from witnessing traumatic events. These studies constitute a valuable contribution to the literature, in terms of

the effective mode and key components of interventions, as well as describing the types of mental health problems experienced by refugees. Given its impact on families and parents in particular, this a fundamentally important area of research, especially given the complex mental health and quality of life needs of children after resettlement in the host country (Silove et al., 2017). This might be needed in other areas related to the health of refugees, which can also profoundly impact their overall health and should therefore be studied with similar rigour, an example of which is overweight and obesity.

Finally, interventions have been developed to tackle health inequalities between the host population and migrant groups, especially refugees. An early intervention among a refugee population in Australia, in an attempt to raise awareness and increase the utilisation of health services to promote health and education, found significant changes in the knowledge and attitudes of parents towards infectious diseases (Sheikh & MacIntyre, 2009). This finding was mirrored in a later community-based participatory intervention (i.e. a partnership approach to developing an intervention in which researchers and community members are equally involved), that sought to lower diabetes-related health disparities among refugee and immigrant patients with type II diabetes and successfully employed a digital storytelling intervention to improve diabetes management (Hearod et al., 2019; Njeru et al., 2015). Similarly, a culturally-appropriate, community-based approach led to improved early oral prevention, treatment of oral health and better dental care among pre-school children in families of recently settled refugees in Australia (Nicol et al., 2014). This supports earlier research which argues that school and community-based interventions are effective strategies to help refugee children to overcome difficulties arising from resettlement (Johnson et al., 2009; Tyrer & Fazel, 2014).

In the literature of interventions designed for refugees, many considerations were made in the approaches that should be used targeting this population, such as peer-based, community-based, school-based and family-based interventions(Berge & Everts, 2011; Tyrer & Fazel, 2014; Wieland et al., 2018; Wieland et al., 2016b). The table below summarised these interventions, targets and populations (see Table 1.1). This section discusses the advantages and limitations inherent to these approaches.

A peer-led intervention is based on the involvement of people who share similar beliefs, ethnicity, religion, or other common factors, who then collaborate to manifest changes in the

health behaviours of their own communities (Webel et al., 2010). In a study of African refugees in Canada, which was facilitated by peers and professionals, it was reported that this approach offers benefits that include increased social integration, decreased loneliness and an expanded repertoire of coping strategies among refugees (Stewart et al., 2012). This supports an early systematic review, which found that a major consideration in the development of an appropriate health service model for culturally and linguistically diverse communities in Australia, is the use of trained bilingual health workers who are culturally competent (Henderson et al., 2011). Furthermore, a recent review on the interventions delivered by peers to support the resettlement process of refugees and asylum seekers found that peer-based interventions were effective in emotional support, community integration, acculturation, and securing better access to services (Mahon, 2022). However, the review highlighted that the provision of training and supportive supervision of those delivering interventions affected the effectiveness of the interventions. The review noted that information on training remains unknown and is poorly reported, adversely affecting the efficacy of some peer-based interventions, meaning that more support is required for peers to be properly effective (Mahon, 2022).

Table1: Summarising interventions targeting refugees

Study	Intervention approaches	Interventions targets	Population	Advantages	Disadvantages
(Henderson et al., 2011)	peer-led intervention	Systematic review of the effectiveness of culturally appropriate interventions to prevent chronic diseases in refugees communities	• Refugees families **Australia**	• Increased social integration, • Decreased loneliness • Expanded repertoire of coping strategies among refugees • peer-based interventions were effective in emotional support, community • Integration, acculturation, • securing better access to services	• The effectiveness of peer-based interventions depends heavily on the training of volunteers. • Volunteer shortages can hinder the effectiveness and scope of interventions, citing a lack of volunteers as a major obstacle.
(Stewart et al., 2012)	peer-led intervention	social support for refugees	• African refugees **Canada**	• Increased social integration, • Decreased loneliness • Expanded repertoire of coping strategies among refugees	• Training volunteers is crucial to the effectiveness of peer-based interventions. No sufficient information on training and being it poorly reported, adversely affecting the efficacy of some

					peer-based interventions, meaning that more support is required for peers to be properly effective.
(Pavlish & Pharris, 2011) **(Baird et al., 2015)** **(Mahoney & Siyambal**	Community-based collaborative interventions	Identify the health challenges associated with the resettlement transition for South Sudanese refugee women in the United States and explore partnerships between university researchers, students, and South Sudanese refugee women	• African refugee women in the **USA**	• Effective in addressing the health disparities associated with marginalized and hard-to-reach populations, such as resettled African refugee women • The importance of making connections with families and the wider community	• The high cost of designing and implementing community-based intervention • The cost also considered as disadvantage by participants especially regarding transportation and travel requirements

apitiya, 2017).					
(Tiedje et al., 2014)	Community-based collaborative interventions		Refugees families (Hispanic, Somali, Sudanese) in the **USA**	• Positively impact the social inclusion and connectedness of refugees and asylum seekers	
(Lecerof et al., 2017)	peer-led intervention	This study aimed at the promotion of healthy behaviours, such as increased physical activity	Refugees adults in **Sweden**	• peer-to-peer health information interventions raise the self-reported level of knowledge of recently settled migrants, resulting in	• Its focus on adult Iraqi refugees, as well as the lack of measurable health effects, which limits the value and the benefits of these

		and the adoption of a healthy diet.		improved diet and higher levels of physical exercise	findings in terms of implementation for refugee groups from other contexts or countries of origin.
(Wieland et al., 2012)	a community-based participatory approach	aimed to increase physical activity and improve the nutrition of refugee women resettled in the USA	Refugee women resettled in the **USA**	• a high level of acceptability and demonstrated significant improvement in healthy behaviours and quality of life	the vast majority of these interventions were targeted at adults.

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Community-based collaborative action research has also been used to address the health concerns of refugees, (Pavlish & Pharris, 2011). A community-based approach has proven to be effective in addressing the health disparities associated with marginalised and hard-to-reach populations, such as resettled African refugee women (Baird et al., 2015). Using peer-based, community-based models can be especially effective for interventions targeting vulnerable populations like refugees, as shown in recent studies using a focus group of immigrants and refugees, which highlighted the importance of making connections with families and the wider community (Tiedje et al., 2014). This supports the findings of a systematic review of health literature found that community-based programmes may positively impact the social inclusion and connectedness of refugees and asylum seekers (Mahoney & Siyambalapitiya, 2017).

Another area that has been covered in the literature is health behaviours, although comparatively few studies have addressed this topic in populations of refugees who have resettled in developed countries. Similarly, relatively few interventions have been reported on the promotion of healthy behaviours, such as increased physical activity and the adoption of a healthy diet. This is despite evidence illustrating that peer-to-peer health information interventions raise the self-reported level of knowledge of recently settled migrants, resulting in improved diet and higher levels of physical exercise (Lecerof et al., 2017). The limitations of this particular intervention was its focus on adult Iraqi refugees, as well as the lack of measurable health effects, which limits the value and the benefits of these findings in terms of implementation for refugee groups from other contexts or countries of origin. A similar intervention by Wieland et al. (2012) aimed to increase physical activity and improve the nutrition of refugee women resettled in the USA, utilising a community-based participatory approach. They found a high level of acceptability and demonstrated significant improvement in healthy behaviours and quality of life (Wieland et al., 2012). However, the vast majority of these interventions were targeted at adults. As refugee children may require different approaches, it is essential to evaluate previous approaches that specifically target this vulnerable group. This narrow focus is exacerbated by the lack of knowledge about interventions addressing overweight and obesity, despite the existence of many interventions aiming to address general health problems in refugee populations.

Recently, more studies in the literature have focused on the health behaviours of immigrants and refugees. Many recent interventions focused on tackling childhood obesity among this population. As an example of these, “Healthy together” is a programme designed to promote

physical activity and healthy eating for immigrants and refugees' families resettled in Canada (Huisken et al., 2021). Although the programme demonstrated strong potential to fill gaps in the community programming for immigrant and refugee families, its limitations included the involvement of both immigrants and refugees, as well as the lack of clear distinguishing in the involvement of refugee's families. Essentially, this means that the intervention did not take into consideration the unique experience and needs of refugees. Additionally, neither immigration status nor length of time in Canada were provided in the data (Huisken et al., 2021). Similarly, a recent intervention was designed to address the dietary acculturation barriers to and facilitators of food security among Burundian and Congolese refugee families resettled in the USA, based on a cooking curriculum that culturally focused on families and youths aged 8 to 12 years (McElrone et al., 2020). Although this intervention focused more on the unique experience of refugees, it did not include the critical early years of childhood. This is particularly important given the influence of the early environment on the health of children and significance in obesity development (Anzman et al., 2010). Additionally, most excess weight is gained before 5 years of age, highlighting the critical role that this early period plays in contributing to childhood obesity (Gardner et al., 2009; Hui et al., 2008; Monteiro & Victora, 2005; Ong & Loos, 2006). Thus, addressing health behaviours related to childhood obesity requires a focus on early childhood (Anzman et al., 2010; Lanigan et al., 2010). Therefore, there is still a gap in the literature relating to the prevention of childhood obesity among refugees by tackling these health behaviours among young children.

1.8 Summary of limitations and gaps in the current literature

The majority of the existing studies into rapid weight gain among refugee children have been conducted in the USA, Canada, Australia and other mainland European countries. However, despite a recent surge in levels of resettlement, comparatively little is known about the health and weight of refugee children displaced into the UK. This increase necessitates urgent research to provide a deeper understanding of the numerous factors influencing weight gain in refugee populations, in particular the negative health behaviours adopted post-resettlement that contribute to this gain. In addition, it is also important to investigate how these factors in the UK compare to those in other developed countries, such as Australia, Canada or the USA, especially given that the relevant policies, education and health systems, and refugee organisations differ between each country. Ultimately, this thesis seeks to address this gap in understanding regarding the refugee experience in the UK, identifying the factors that influence the development of obesity and weight gain to enable the long-term design and development

of an intervention to help this population. The importance of this investigation is underscored by the current unfortunate situation in the Middle East region and other parts of the world, which has led to a dramatic increase in the numbers of refugees entering developed countries. The growing refugee population places an additional burden on health services and necessitates the development of interventions that target obesity in refugee children. Therefore, it is important to explore factors influencing weight among refugee families with young children after their resettlement in the UK, in order to gain a deeper understanding of the reasons and factors that contribute to unhealthy weight change. These findings will provide important information to assist local services with the provision of the best support for this population, as well as building towards the design and development of interventions to tackle this problematic trend.

1.9 Chapter summary:

Chapter 1 provided an overview of two main problem areas which need addressing as a whole; childhood obesity and obesity-related health behaviours. Patterns of childhood overweight and obesity were described, along with discussion of key main topics such as the experience of forced migration and the consequences of childhood obesity among the refugee population. Obesity-related health behaviours were then discussed, alongside a discussion of the current literature, interventions for this population and identifying gaps in the literature. It is evident this is a population where obesity is a rising problem and that interventions are lacking deep understanding of the complex and different factors influencing their health behaviours. Research is needed to understand the factors that give rise to increased prevalence of obesity in this population, identify key behaviours to address and develop a culturally acceptable and theoretically informed intervention.

Chapter 2. Thesis aim and study objectives

The aims of this thesis are as follows:

1. To determine the factors that influence unhealthy behaviours related to obesity in refugee families with young children after their resettlement in the UK.

2. To explore the experiences and perspectives of refugee parents regarding health behaviour changes (i.e. changes in diet, levels of physical activity) and the impact of these changes on the weight of their young children.

3. To design a culturally appropriate intervention targeted at obesity-related health behaviours among this population.

4. To determine the acceptability of the intervention.

Key research questions were identified:

1) What are the factors that influence health behaviours related to obesity in refugee families with young children after their resettlement in a developed country?
2) What are the factors that influence health behaviours related to obesity in refugee families with young children after their resettlement in the UK?
3) What are the experiences and perspectives of refugee parents regarding health behaviour changes (i.e., changes in diet, levels of physical activity) and the impact of these changes on the weight of their young children?
4) Is a culturally appropriate intervention targeted at obesity-related health behaviours among this population acceptable to them?

These aims and questions are addressed through four studies, each with their own specific objectives:

What factors are associated with obesity-related health behaviours among child refugees following resettlement in developed countries? A systematic review and synthesis of qualitative and quantitative evidence (Published paper, Chapter 3)

Intervention design stage: Understand and define the problem.

Objective: To identify the factors identified within the literature that influence health behaviours related to obesity in refugee children after their resettlement in developed countries.

A qualitative investigation of the health behaviours of young children from refugee families using Photo Elicitation Interviews (Published paper, Chapter 3)

Intervention design stage: Identify what needs to change.

Objective: To explore the experiences and perspectives of refugee parents regarding health behaviour changes among their children (i.e. changes in diet, levels of physical activity) and the impact of these changes on the health of their children aged 2-10 years.

Development of a culturally appropriate intervention targeting health behaviours among refugee families with young children

Intervention design stage: Identify what needs to change, identify theory, Identify/design intervention components and delivery options.

Objective: To describe in detail the process of developing the "Be healthy "intervention, which was designed in a culturally and linguistically appropriate way to target snacking and sedentary behaviours among refugee parents with young children.

Acceptability study of a tailored intervention to reduce snacking and sedentary behaviour in young children of refugee parents

Intervention design stage: Refinement stage

Objective: To determine acceptability of the "Be healthy" intervention to refugee parents with young children.

Chapter 3. Methodology

3.1 Chapter overview

Since this thesis is presented in journal style, each empirical study includes a separate methods section. This chapter provides an overview and rationale for the different methods used throughout the PhD, along with details and explanations regarding each approach, as well as the key methodological debates in the literature. Further details and justifications are provided for each method used in the study, beyond what is presented in the empirical chapters. With journals having word limits, it is often challenging to provide sufficient details regarding the methods used.

3.2 Research paradigm

A research paradigm is defined as the philosophical framework and patterns of beliefs upon which the research is based, including ontological and epistemological approaches (Creswell & Creswell, 2017). Ontology has been described as the study of being (Crotty, 1998). The study of ontology is concerned with assumptions we make about what makes sense or is real, or the nature or essence of the social phenomenon being studied (Kivunja & Kuyini, 2017; Scotland, 2012). While epistemology is concerned with how knowledge can be produced, in research, epistemology refers to the process by which knowledge is obtained, as well as how we determine truth or reality (Kivunja & Kuyini, 2017). Ontological and epistemological approaches inform the decision regarding the appropriate research methods that should be used. Research based on the positivist paradigm utilise deductive logic, formulation of hypotheses, testing those hypotheses and offering operational definitions and, as such, advocates the use of quantitative research methods. In contrast, a constructivist approach focuses on understanding experiences from the perspective of those experiencing them (i.e., lived experiences), acknowledging that participants play a role in creating experiences, and co-constructs understanding between researcher and participant, and is therefore more suited to qualitative methods (Creswell & Creswell, 2017).

This PhD focuses on refugee families and exploring their perspectives to better understand their experiences. Therefore, it is crucial to examine the application of a philosophical approach to the understanding of experiences of violence and displacement. Researchers in the field of forced migration tend to rely on qualitative methods, which offers a deeper understanding of

experiences of displacement (Donà et al., 2022; Eastmond, 2007; Esin, 2017). Qualitative research in refugee studies refers to *"a philosophical approach to the understanding of experiences of violence and movement through interpretive perspectives, describes a set of methods for collecting stories and voices and the tools used to analyse stories, adopts a reflexive approach to examine the relationship between researchers and participants and the dynamics of research process"* (Donà et al., 2022, p. 3). Recently, there has been an evolution in the methodological framework most commonly utilised in refugee research: the dominant mono-sited research design informed by methodological nationalism, the consolidation of multi-sited research in the context of transnational connections, and the emerging field of virtual-sited research among online diasporas (Donà et al., 2022). According to Wimmer and Schiller (2003), methodological nationalism frames migration research within the context of national borders: inside countries of origin, refugee camps, during the resettlement process or while returning home (Donà et al., 2022; Wimmer & Schiller, 2003). In a mono-sited and mono-temporal study, methodological nationalism affects the choice of contexts and groups to be studied: internally displaced people, refugees in camps, asylum seekers in countries of settlement, or returning refugees (Donà et al., 2022).

Based on the discussion above the most suitable way to achieve the aims of this PhD was deemed to be through qualitative methods within a transnationalism approach, this approach was a result of moving from nationalist towards transnationalism, with its focus on understanding the unique experience of refugees moving from their home country to resettle in the UK. Qualitative methods were chosen to gain a better understanding of the difficult experiences of refugees and to provide rich data that capture the experience from their points of view. This is a position supported by the literature, that states that qualitative methods are the most widely used and appropriate methods to examine the complex life experiences and cultural norms of refugees (Donà et al., 2022; Gabriel et al., 2017; Halabi, 2005). The researcher had experience in qualitative methods from previous research roles and through the completion of a qualitative MSc. In addition, there was sufficient expertise present within the research team to support this methodological approach.

3.3 Qualitative method approaches

A qualitative approach was used in this thesis for several key reasons which will be discussed in more detail in the sections below. In addition, based on the aims and objectives of the

research, these methods were deemed to be the most appropriate for informing and addressing these issues comprehensively.

In order to determine the type of study design and to formulate instruments for collecting information, several important decisions are made at the beginning of the study. In this thesis I focus on a vulnerable population: refugee families with young children. This population has experienced war, conflict and different types of violence and traumatic events. Therefore, the process of deciding which appropriate methodological approach to adopt required consideration of the debates in the literature regarding methodological approaches.

There has been a clear evolution in the ways that refugee research has been conducted. It was during 1982–1983, when Oxford University created its Refugee Studies Programme, that multidisciplinary research became the methodological agenda of refugee studies, resulting in a qualitative shift in refugee research methods (Voutira & Doná, 2007). According to Roger Zetter, in refugee studies, researchers are encouraged to identify, explain, and promote an understanding of the determinants of refugee lives both within refugee and host communities, as well as to convey refugee perspectives and stories (Zetter, 1991). Therefore, most of the researchers in the field of refugees use qualitative research more than other methodological approaches.

In this thesis I wanted to explore more and deepen my understanding of the experience of refugee parents with young children, and concluded that a qualitative approach was the most appropriate way to achieve this. This section provides a detailed overview of the qualitative approaches utilised in this thesis.

3.3.1 Systematic review (Chapter 4)

There was a clear lack of research providing a deep understanding of the factors associated with behaviour changes and obesity among refugee families after their resettlement. Therefore, it was important to conduct a systematic review of the complex factors that influence obesity-related health behaviours in refugee children after their resettlement in developed countries. A systematic review is a methodical, rigorous approach to synthesising data, viewed as the highest level of evidence quality, which is used to form clinical guidance (Moher et al., 2015b). Systematic reviews provide the best evidence base for the formulation of trustworthy clinical guidelines and their recommendations. Furthermore, thematic synthesis and narrative synthesis were deemed to be the most appropriate methods to inform the objectives of the review.

According to systematic review guidelines, a detailed protocol was developed with regard to the purpose, study criteria, search strategy, data extraction, quality appraisal, and analysis of the study (Moher et al., 2015a). The methods followed to conduct the systematic review are reported in detail in Chapter 4, so this section outlines the quality assessment pertaining to the cultural sensitivity of the studies included in the review.

It was highly important to not only assess the quality of these included studies but also provide cultural assessment to provide the literature with further leans that could enhance the development of research designed for cultural ethnicities.

3.3.1.1 Culturally sensitivity in research

Culturally sensitive research refers to designing the research to incorporate a target population's beliefs, characteristics, attitudes, values, traditions, experiences, and norms into the research design, implementation, evaluation, and materials; this enhances the quality as well as the validity of the findings (Kam et al., 2017; Van de Vijver & Leung, 2021). Not only it is important from an ethical perspective, but also conducting culturally sensitive research emphasises the validity of the research design and the results. The value of cultural sensitivity comes from how culture can have an influence on participant's interactions with the research, as well as their responses to the research questions. In addition, studies that ignore or fail to account for the cultural perspective of participants are invalid, as the findings may not be representative of participant perspectives, and thus, the study may not be able to generalise its findings.

Cultural sensitivity is highly relevant to the research conducted on people from different cultures especially on the growing research focusing on immigrant populations. The concept of cultural sensitivity includes an understanding of both the general dimensions of culture as well as the particular beliefs associated with the research topic. Culture and cultural systems of value have a huge effect on health. It affects many aspects of health, including how people perceive health, illness, and death, beliefs about the causes of disease, approaches to health promotion, and how they express illness and pain (Napier et al., 2014). Therefore, understanding health-related issues from a cultural perspective is particularly important (Kam et al., 2017).

Since the systematic review focused on refugee families, it was critical to assess the cultural sensitivity of the included studies. Ethnic minorities have diverse languages, health literacy,

cultures, religions, and socioeconomic status, which researchers need to take into account when designing research in this area. This is especially the case for studies that examine migrants from cultures that are completely different from their own. Therefore, a cultural sensitivity assessment was applied to all the studies included in the systematic review. This approach is relatively novel, having only been used in a few previous systematic reviews on other ethnic minorities (Nazir, 2015; Waheed, 2010b). This systematic review assessed cultural quality of the included studies using a twelve-point check adapted from Waquas (2010) and Nazir (2015). The check comprises twelve areas and was developed for a specific population. However, the included questions were adapted to make them as general as possible, to cater to the variety of cultures included in the review. The check included the following questions: Were any of the authors from the same ethnicity background of the participants?, Was the ethnicity of the target population defined?, Was the family consulted?, Were community agencies consulted?, Were interpreters used?, Was validity and reliability of translated questionnaires tested?. In addition, the check covered areas relating to: the consideration in selecting the measuring tool, language offered, the language preferred by participants, process of translation, ethnic matching of interviewers, and cultural consideration in interviewer/interpreter training. A more detailed discussion of the cultural quality of the included studies is provided in the Appendix A.

3.4 Qualitative interviews using photo elicitation (Chapter 5).

This study was concerned with gaining an in-depth understanding of the challenges facing refugee parents and their views on their role regarding the changes in the health behaviours of their children. Therefore, this study focused on the refugee parents of young children, given that previous studies have shown that parents have control over the health behaviours of their young children (Beets et al., 2010; Pyper et al., 2016) . This study aimed to: 1) gather parental perspectives of refugee families regarding the changes in health behaviours from pre-resettlement to post-resettlement; 2) identify the salient factors that influence the pre/post-settlement changes in the health behaviours of parents; and 3) explore the role of parents in influencing their children's health behaviours. Below is an overview and discussion of the methods used. The detailed methods followed in conducting this study are reported in (Chapter 5).

The study used a qualitative approach to the collection of data, as these provide context-specific insight, especially at the early stages. Qualitative research was also chosen for the purpose of studying refugee families, since it has been proven from the literature that people who flee war

or persecution feel unvalued and unheard, regardless of whether they are in the country they have fled to or their host country (Peel et al., 2021). For this reason, using qualitative methods enables refugees' voices and experiences to be heard, which can be powerful and meaningful for them.

3.4.1 Interviews

Our knowledge of the personal and social aspects of people's lives is enriched by conversations, which are considered rich and indispensable sources of information (Leavy, 2014). The concept of conversations in the human and social sciences has been developed into a specific research method which are called research interviews (Leavy, 2014). In the research interview, knowledge is constructed through interaction between the interviewer and interviewee (Newcomer et al., 2015). In the literature there are different types of research interviews: structured, semi- structured and unstructured. Structured interviews, as with questionnaires, are conducted in a standardised manner in which questions are asked to yield answers that can be compared across participants to enable the researcher to gather more information. Although it has benefits for some types of research, it fails to capitalise on the potential knowledge production that is often inherent in human conversation (Leavy, 2014). In contrast, unstructured interviews, such as life story interviews, usually do not have any structure. Unstructured interviews have been described as going into the field and discovering what is going on. In this type of interview, the interviewers offer minimal control over the process of data generation, allowing the interview to be led by the interviewee (King et al., 2018). This affords the interviewee greater control and power over the process and as such it is considered a valuable tool that generates rich qualitative data. However, it is time consuming and can lead to collecting too much data that is not related directly to the topic. Semi-structured interviews sit between structured and unstructured interviews, and are conducted with a blend of closed- and open-ended questions, often followed by why or how questions. Semi-structured interviews offer greater opportunities to use dialogues for knowledge-producing purposes by allowing the interviewee to pursue any angles they consider important (Peters, 2010). As well as this, the interviewer is more likely to be seen as a knowledge-producing participant within the interview process itself, rather than hiding behind a predefined interview guide. In addition, semi-structured interviews are probably also the most common form of interviewing for research purposes (Peters, 2010).

Semi-structured interviews were chosen to allow the participants to express their experiences in their own words. We know from the literature that refugees are vulnerable populations that face barriers when it comes to communicating their experiences. To gain a deeper understanding of the situation, semi-structured interviews have been proven to be a successful method for exploring and collecting more information. This level of deep reflection and sharing is valuable and can not been achieved by other research methods (Leavy, 2014; Newcomer et al., 2015). In an attempt to enhance engagement with the interview, as well as the richness and depth of the data generated by the interviews, photo-elicitation interviews were chosen in this study.

3.4.2 Photo-elicitation interview (PEI)

A photo-elicitation interview (PEI) is a qualitative technique in which the researcher uses photographs or other images as stimuli to elicit responses, reactions, and insights from participants (Copes et al., 2018). Photographs have the potential to tell different stories about someone's life. From the literature we know that photographs have long been used in social science research. Since Collier (1957) illustrated the value of photographs for interviewing, sociologists have been using them to elicit responses (Copes et al., 2018). The use of photographs and other visual stimuli may elicit emotions more than the use of written words. An additional benefit of using photographs is the ability for the researcher to access a world that may be unfamiliar, thereby providing a shared understanding of the participants' experience.

It is possible to conduct photo-elicitation interviews independently, but they are most effective in conjunction with traditional interview methods to provide additional depth to participant responses (Padgett et al., 2013). Whether the images are provided by the researchers or the participants, pictures can evoke emotions, memories and reactions, or connect concepts in ways that verbal communication cannot, because images can *"mine deeper shafts into a different part of human consciousness than do words-alone interviews"* (Harper, 2002, p. 23). There are two primary variants of PEI: Researcher-driven and Participant-driven (Copes et al., 2018). This study have focused on a participant-driven approach, in combination with the use of a PPI group to provide the images utilised in the interviews, thereby creating opportunities for the active involvement of respondents in the generation of data (Clark-Ibáñez, 2004; Frohmann, 2005). Using the participant-driven photo-elicitation approach reduces the historical power dynamic between researcher and participants which is commonly embedded in the selection of

specific images, subjects, and themes in interviews (Copes et al., 2018; Lapenta, 2011, p. 206). This approach combines a participant-driven approach with the use of a PPI group to provide images for the interviews, thereby allowing respondents to actively participate in the data collection process.

A further advantage of photo elicitation is that it can help stimulate discussions with interviewees, gaining deeper insights into the topic. In this case, it can help stimulate the way in which refugee parents make sense of their experience and their roles regarding their children's diet and physical activity (Brooks & King, 2017; Elliot et al., 2017; Hurworth et al., 2005). This use of photographs as a communicative tool has been recognised in the literature as helping researchers make sense of the experiences of refugee children (Gifford et al., 2007; Svensson et al., 2009). The use of photographs has been recommended for use in research with refugees, as it can be an *"excellent strategy for building trust and rapport between researchers and participants"* (Gifford et al., 2007, p. 428).

PEI method was chosen for the study presented in chapter 5, because refugee parents are considered a vulnerable population, who often have experienced traumatic events that may cause them to feel emotional or sensitive when reflecting upon the changes that have occurred in their lifestyle after resettlement. This method enables the researcher and participants to share control of the interview process, allowing interviewees to select images that evoke reactions, emotional responses, and meanings that may not have been accessible using verbal methods alone (Brooks & King, 2017; King et al., 2018). This is considered a multimodal approach, which has proven to offer multiple advantages in research on refugees and displaced populations: increasing the opportunity for participation if the research is conducted in a language other than their native tongue; and providing a deeper understanding of participants' experiences across different cultural, social, and linguistic contexts through the collection of information about their lives through multiple modes (Donà et al., 2022). This data collection method provides a context for the participant to discuss potentially sensitive topics and has been successfully used in research conducted in refugee settings (Gifford et al., 2007; Svensson et al., 2009). The PEI method provides immediate feedback to participants, offering an effective way of building trust and rapport, as well as enhancing the rigor of qualitative methods through multi-method triangulation (Hurworth et al., 2005; Orellana, 1999).

Study materials were developed based on the findings of the systematic review and existing research, as well as discussions with experts in the field and individuals from the study population. The social cognitive theory (SCT) was used to develop the interview guide (Bandura, 2004). According to this theory, individual factors (e.g., self-efficacy to become physically active) interact with social environmental factors (e.g., social support) to affect health behaviour (Wieland et al., 2016a). This is particularly relevant in this context given that low self-efficacy is considered an influential barrier to eating a healthy diet and being physically active (Sheeshka et al., 1993; Trost et al., 2002). Furthermore, a supportive family environment has an important, positive influence on health behaviours among immigrant families (Marquez & McAuley, 2006).This theory has been instrumental in forming the conceptual base of previous research targeting refugee families (Tiedje et al., 2014; Wieland et al., 2015b).

The interview topic guide included questions that assessed: 1) participants' understanding of what comprises a healthy diet, descriptions of food and types of physical activity, food environment, and dietary patterns; 2) participants' perceived barriers to eating healthy food and being physically active for their children and as a family; and 3) differences in dietary patterns and levels of physical activity in their original home countries and in the UK.

The photos were used within the interviews with each question. The researcher displayed a photo that related to the topic, using each image as a prompt to initiate further dialogue and to follow up new, emerging ideas, as well as the use of probes. For example, when asking participants about their meal routine, the researcher would present a photo that represented mealtime in their culture, which enhanced the opportunity for participants to share more and for the researcher to further explore their experiences. The process used to generate the images used during the PEI is outlined below (Chapter 5).

3.5 Developing and designing interventions for health behaviour change

One of the objectives of this thesis was to design a behaviour change intervention. It is important to highlight that intervention design is considered a complex process. In the literature there are different frameworks that can inform the development of complex interventions. The Medical Research Council (MRC) developed a framework for "development and evaluation of complex interventions', which is commonly used in the UK to guide the development of non-pharmacological interventions to improve health (Craig et al., 2008). According to the four main stages of the (MRC) guidance, complex interventions should be developed,

feasibility/piloted, evaluated, and implemented (Craig et al., 2008). Using this framework is considered highly valuable and effective, since it helps researchers identify the key questions about complex interventions and the rigorous way to develop them. In addition, the framework has been updated several times since 2006 to take into consideration some of the limitations and details of the steps to follow when designing complex interventions. In 2021, the guidance was updated to provide more comprehensive detail (Skivington et al., 2021).

There have been other health intervention development frameworks that provide guidance for researchers developed contemporaneously. Following a review of behaviour change intervention frameworks by Michie, Van Stralen, and West (2011), 19 frameworks that could be used to guide intervention design were identified. As part of their review, Michie and colleagues assessed existing interventions based on their comprehensiveness, coherence, and how well they connected to overarching behaviour models (Michie et al., 2011). As result they concluded that there was no framework out of the 19 reviewed that was completely comprehensive. Only a minority of frameworks were determined to be coherent or were sufficiently linked to a model of behaviour (Michie et al., 2011). To synthesise this literature to provide a comprehensive framework that is clearly connected to behaviour models, Michie and colleagues developed The Behaviour Change Wheel (BCW), which includes the COM-B integrated model of behaviour (Michie et al., 2014).

3.5.1 The Behaviour Change Wheel

Presented as a wheel of layers, the Behaviour Change Wheel (BCW) see Figure 3.1 (Michie et al., 2011) identifies key stages and considerations in intervention design. In describing COM-B (Capability, Opportunity, Motivation), the authors refer to it as a “behaviour system,” demonstrating that behaviour is the result of changes to one or more of these factors; motivation can be influenced by capability and opportunity, and all three can influence the behaviour. First, capability is considered as a combination of knowledge and mental capacity (psychological capability) as well as physical skills necessary for a particular behaviour (physical capability). Secondly, opportunity which refers to the external environment that influences the behaviour in two different ways, including the people and the norms in society (social) as well as the surrounding environment (physical). Finally, motivation which can take the form of purposeful goals and intentions (reflective) as well as more habitual and emotional responses (automatic) (Michie et al., 2011). This COM-B model explains the behaviour as complex system and provide model to understand behaviour change on deeper level.

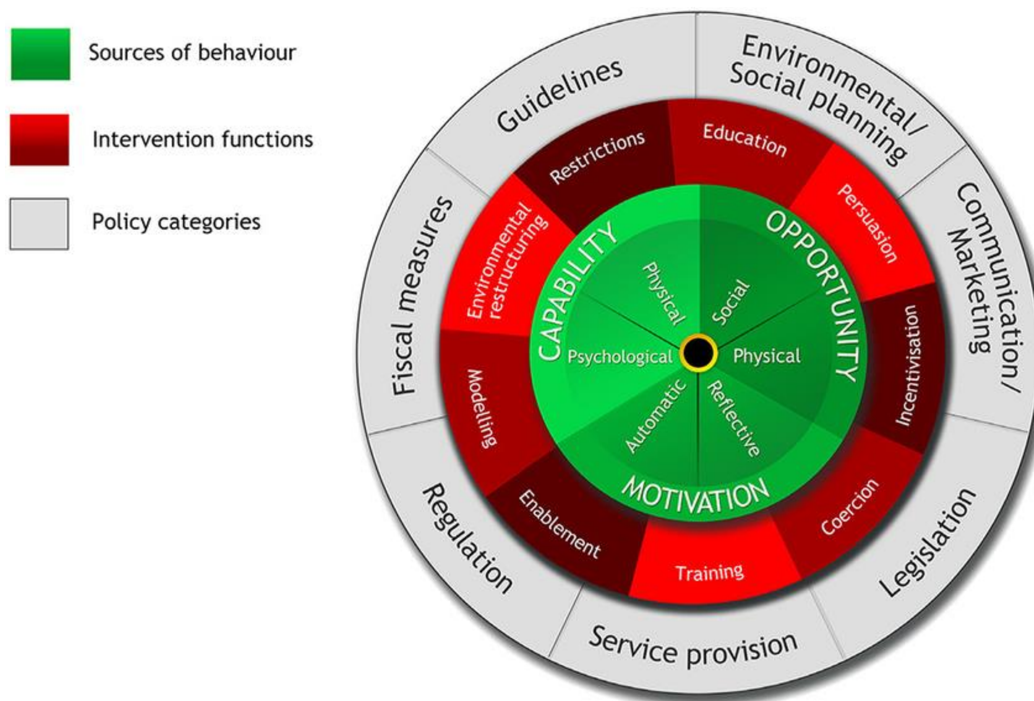


Figure3.1. The Behaviour Change Wheel (Michie, Atkins, & West, 2014)

The BCW has many strengths that were highlighted in the literature, including the successful integration of theory and evidence in designing an intervention which was built on covering a gap in the literature of behaviour change interventions. This view was supported by several leading health psychologists where they described the BCW as a useful and comprehensive tool (Araújo-Soares et al., 2019). Moreover, the BCW includes guidance on intervention development which can be very useful to novices as well as those designing real world interventions (Teixeira, 2016). The BCW has been reported as very thorough and particularly helpful to novice intervention designers, compared to Intervention Mapping (Bartholomew et al., 1998), which has been criticized for being overly technical, making it difficult for those who have not designed interventions before (Coupe, 2020; Wight et al., 2016). However, the BCW has been also criticised for being time-consuming, like intervention mapping, meaning that identifying what needs to change and implementing an intervention may take some time (Casey et al., 2019; Coupe et al., 2022; Murtagh et al., 2018). However, generally the BCW has the potential to be useful for many researchers, due to its ability to be applied across all behaviours, not just health. As a result of the comprehensiveness of the BCW as an intervention design framework and its clear guideline the researcher chose it as the most suitable framework for this PhD. Following this the researcher attended a week-long BCW training camp that

enhanced her understanding of the framework and provided support during the intervention development stage.

3.6 Intervention Development (Chapter 6)

This stage involved following the BCW to inform the design of the intervention. The PhD involved six stages. This section gives an overview on the methods used in the intervention development and more detailed discussion on how each step of the BCW was followed can be found in the results section (Chapter 6).

As part of the BCW, Michie et al. (2011) suggest combining a variety of methods to develop a deep understanding of the situation in its entirety. The intervention development stage began by conducting what they call 'behavioural diagnosis'. A variety of methods are suggested, including literature review and interviews with a range of participants (Michie et al., 2011). In a behavioural diagnosis, the goal is to determine what needs to be changed in each component of COM-B in order for the behaviour to occur. Even though the BCW offers its own integrated model of behaviour in the form of the COM-B model, its authors suggest applying other relevant theories, including the Theoretical Domains Framework (TDF) (Cane et al., 2012; Michie et al., 2005). These domains were originally designed to inform theoretically-based interventions that change clinician behaviour, but they have been refined and linked to the COM-B components to better explain the behavioural diagnosis. The TDF includes 14 domains of theoretical constructs, including Knowledge, Skills, Social/Professional Role and Identity, Beliefs about Capabilities, Optimism, Beliefs about Consequences, Reinforcement, Intentions, Goals, Memory, Attention and Decision Processes, Environmental Context and Resources, Social Influences, Emotions, and Behavioural Regulation. Therefore, the behavioural diagnosis was conducted using both the COM-B model and TDF. A secondary deductive analysis on the qualitative data was conducted to inform the intervention design development.

3.7 Acceptability study (Chapter 7)

Acceptability refers to the cognitive and emotional reaction to an intervention, which is a fundamentally important element in determining its success. The level of perceived appropriateness of a given intervention is considered as a reliable indicator of the participants' intention to engage with the programme.

According to the Theoretical Framework of Acceptability, acceptability consists of affective attitude (feelings about participating in an intervention and feelings about the intervention),

burden (effort required to participate in the intervention), perceived effectiveness (perceived likelihood for the intervention to achieve its intended purpose), ethicality (the fit with their value system), intervention coherence (understanding the intervention and how it works), opportunity costs (what must be given up to engage in an intervention), and self-efficacy (confidence that the behaviours required to participate in the intervention can be performed) (Sekhon et al., 2017). This study was concerned with exploring the acceptability of the first draft of “Be healthy”, a culturally appropriate behaviour change intervention that targeted the refugee parents of young children. All the detailed methods used to conduct this study are reported in the relevant paper’s Results section. Here we provide more details regarding the methods used to assess the acceptability of the intervention.

3.8 Qualitative analysis approaches

Several methods of analysis are available to qualitative researchers, including both deductive (theory-based) and inductive (theory-generating) (Forrester & Sullivan, 2018). The data analysis process that uses thematic analysis (TA) is discussed below in more detail.

3.8.1 Inductive thematic analysis:

It is important to distinguish between deductive and inductive approaches to theme identification. The inductive approach draws themes from the researcher's data (Varpio et al., 2020). Since these themes are data driven, they may not reflect specific questions asked of participants (for example, if participants diverged from topic) and they may not reflect the researcher's interests or beliefs (Braun & Clarke, 2021). A deductive approach, on the other hand, finds themes of interest based on pre-existing theories, frameworks, or other researcher-driven factors (Braun & Clarke, 2021; Varpio et al., 2020). It is therefore common for inductive approaches to provide a broader, more comprehensive analysis of the entire data set, whereas deductive approaches are useful for focusing on specific findings that are best understood or illuminated within the context of pre-existing theories or frames (Braun & Clarke, 2021; Varpio et al., 2020). The qualitative study was concerned with exploring refugee parents' perspectives about their young children’s changes in health behaviours such as diet and physical activity. It focused on their role in this change. Therefore, an inductive approach was used to explore the data and generate knowledge on an under researched topic.

An interpretive phenomenological analysis (IPA) method (Smith et al., 2009) is also commonly used in psychological qualitative research. This involves developing an in-depth understanding of how people interpret their own experiences in relation to a given topic or phenomenon.

Moreover (IPA) is a relatively well used approach in the literature of refugee research (Chaffelson et al., 2022; Tessitore et al., 2019). Nevertheless, we decided this method would not be appropriate in this study, since it emphasises understanding individual narratives rather than overarching experiences, which is incompatible with the aims and objectives of the study to understand the experiences and the challenges these parents face. Therefore, the data generated by parents were analysed using thematic analysis (TA). TA was considered as a systematic method for analysing and organising qualitative data, and for identifying common themes across data sets relevant to a specific research question (Braun & Clarke, 2021). The process of analyses follows the six phases proposed by Braun and Clarke: 1) data familiarisation and writing familiarisation notes; 2) systematic data coding; 3) generating initial themes from coded and collated data; 4) developing and reviewing themes; 5) refining, defining and naming themes; and 6) writing the report. In phase one, interviews were read several times and notes were made about what was interesting or relevant to our research questions. This allowed the researcher to become familiar and engaged with the data. In phase two, a more formal coding process was conducted, which involved discussion and modification of the codes by the research team. In phase three, we noted codes featuring similar contents and developed these clusters into initial themes. In phase four, themes were developed and reviewed by the research team. In phase five, we refined the developed themes further, which included defining and naming them (Braun & Clarke, 2021). The data were organised with NVivo11 software (Edhlund & McDougall, 2016). Establishing the trustworthiness of the analysis is crucial in qualitative research, thereby assuring the reader that research findings are grounded in the data (Lincoln & Guba, 1985). Trustworthiness was established during the iterative and collaborative process of thematic refinement that involved the wider research team. Interpretation of the data was discussed and where there was disagreement, a consensus was reached that all researchers found satisfactory.

Deductive content analysis

Following the analysis of parents' views (presented in Chapter 5), a deductive analysis was conducted in order to identify an appropriate target for the intervention being developed within this thesis. This section provides a discussion on the qualitative analysis approaches. The qualitative analysis of the parents' views highlighted some of the environmental barriers to eating healthily and being physically active. The TA helped to understand the challenges and needs of the population at a broader level. A deductive analysis was the next step towards

identifying an appropriate target for the intervention being developed within this thesis. This was achieved using the COM-B model as a framework, as recommended within the BCW intervention design process. This deductive analysis was secondary, meaning that the topic guide was not developed based on the COM-B model and that was thought to be the most appropriate way. By using a deductive approach to the entire study, relevant data would have been lost and themes restricted by being based on existing knowledge. Therefore, we chose a successful hybrid approach, which has been used by researchers previously (McCutchan et al., 2016; Wadsworth et al., 2016). After revisiting the data, the researcher recoded initial themes using COM-B constructs looking at Capability (Physical/Psychological), Opportunity (Physical, Social), and Motivation (Reflective, Automatic) (Michie et al., 2011). A preliminary analysis was conducted by the researcher, followed by discussions with supervisory teams, working descriptions of the COM-B constructs as themes were developed and the original data was then incorporated into these themes. The following steps were mapping the COM-B analysis to the TDF.

3.8.2 Qualitative framework analysis

Acceptability is often associated with feasibility studies, where some researchers believe that it is one of eight areas to be measured in feasibility studies along with demand, implementation, practicality, adaptation, integration, expansion, and efficacy (Bowen et al., 2009). In addition, the new MRC guidance, acceptability should be considered as part of the feasibility stage (Skivington et al., 2021). However, according to others, acceptability of the intervention should be evaluated simultaneously with recruitment methods, data collection processes, resources, and success possibilities (Orsmond & Cohn, 2015). The process of measuring acceptability is not straightforward, with others suggest that acceptability should be assessed separately from feasibility and engagement in the intervention design process (O'Cathain et al., 2019). Therefore, the Theoretical Framework of Acceptability (TFA) was developed as a result of identifying this lack of consistency and provided definition of acceptability "*A multifaceted construct that reflects the extent to which people delivering or receiving a healthcare intervention consider it to be appropriate, based on anticipated or experiential cognitive and emotional responses to the intervention*" (Sekhon et al., 2017, p. 4). In addition to the definition, Sekhon and colleagues (2017) described the concept of acceptability, narrowing it down to seven components, which are defined in Table 3.1

Table 3.1: Definitions of the component constructs in the Theoretical Framework of Acceptability (Sekhon et al., 2017)

TFA construct	Definition
Affective attitude	How an individual feels about an intervention
Burden	The perceived amount of effort that is required to participate in the intervention
Ethicality	The extent to which the intervention has a good fit with an individual's value system
Intervention coherence	The extent to which the participants understand the intervention and how it works
Opportunity costs	The extent to which benefits, profits and values must be given up to engage in the intervention
Perceived Effectiveness	The extent to which the intervention is perceived as likely to achieve its purpose
Self-efficacy	The participants' confidence that they can perform the behaviour(s) required to participate in the intervention.

As acceptability of the intervention itself was one of the main objectives of the final study, the researcher identified that the (TFA) consider suitable for measuring acceptability independently. The acceptability study (Chapter 7) used a qualitative approach consisting of semi-structured interviews to assess the acceptability of the “Be healthy” intervention. The topic guide was developed based on the Theoretical Framework of Acceptability (TFA) (Sekhon et al., 2017), and included questions covering the seven constructs acceptability, affective attitude, burden, perceived effectiveness, ethicality, intervention coherence, opportunity costs, and self-efficacy. The TFA was also used to organise the data from the interviews. Using a framework analysis, the findings were analysed deductively by coding data against the TFA constructs (Ritchie & Spencer, 2002). As a whole, the TFA (Sekhon et al., 2017) was an effective tool in determining the acceptability of the intervention developed for this PhD.

Ensuring the Quality in qualitative research

This thesis focused on the use of qualitative methods for several important reasons. These methods were deemed the most suitable to inform and comprehensively address the aims and objectives of our research. In the section below a detailed discussion on the different methods taken to ensure the validity of the results of the research conducted in this thesis.

The objectives of the systematic review were focused on identifying the factors that influence unhealthy behaviours related to obesity in refugee children, where thematic synthesis and narrative synthesis were deemed to be the most appropriate methods to use to inform the objectives of the review. While attempts were made to conduct a meta-analysis in the systematic review, the outcomes of the quantitative papers were too varied and therefore decided to conduct thematic synthesis and narrative synthesis of the literature. In the second study, the objectives were focused on exploring the experiences and perspectives of refugee parents, therefore qualitative methods were considered the most appropriate. Qualitative techniques can be an especially valuable tool to obtain an in-depth understanding of participants in their complex socio-cultural contexts (Leavy, 2014). With each study we considered all methods in order to select an approach that would meet the aims and objective of the study. For example, qualitative methods were chosen for the acceptability study due to their suitability in informing the refinements, during both the early stages of intervention development and also in the final stage when assessing acceptability, when they provided critical insights into the potential effectiveness of the intervention (Ayala & Elder, 2011) and enhanced data richness (Bhatti et al., 2021).

Trustworthiness is an important component of qualitative research, which refers to the ability to establish trust or confidence in the findings of a research study (Leavy, 2014; Mills & Gay, 2019). From the literature we know that qualitative methods have a history of being assessed based on their trustworthiness (Adler, 2022). The concept of trustworthiness concerned more with evaluating the research results by looking at credibility, transferability, dependability, and confirmability. Quality, when applied to qualitative research looks at whether the findings are trustworthy, i.e., would the same conclusions be drawn if the same circumstances prevailed? (Peters, 2010). Therefore, the concept of transparency is the key to trustworthiness regardless of the researcher's approach (Adler, 2022). In addition there are different strategies to maximise the trustworthiness include, triangulation and reflexivity. The section below discusses in detail the strategies that were applied to ensure the trustworthiness of the results in this thesis:

- **Triangulation**: This refers to the process of using multiple approaches, data collection strategies, and data sources to obtain more complete information and to cross check data (Creswell & Poth, 2016; Mills & Gay, 2019). Triangulation is a well-known quality criterion for qualitative researchers (Hayashi Jr et al., 2019), allowing the researcher to explore several aspects of the studied phenomena (Fusch et al., 2017). This thesis applied triangulation of data and triangulation of investigators, enhancing the rigour and quality of data by using different qualitative methods, such as photo elicitation interviews in the second study and the TFA framework in the acceptability assessment (Mills & Gay, 2019; Singh et al., 2021).

- **Establish an audit trail**: This describes the process of ensuring data collection and analysis occur in a transparent manner and are faithful to participants' narratives (Carcary, 2020). This in-depth approach was used from the beginning of the PhD, with methodical documentation of steps taken to conduct the research, including the raw data, data reduction and analysis products, as well as data reconstruction and synthesis products. In addition, different approaches to data collection were used to enhance the quality. For example, in the second study we used photographs and written descriptions of each process, along with field notes. Finally, the coding process was documented in detail (e.g., presented in tables), documenting the different stages of forming the codes into themes and interpretation of them.

- **Peer debriefing**: This involves collaboration between the research team and another researcher outside the research team to ensure that the analyses and interpretations accurately reflect the data. This doctoral research benefited from several collaborations that informed its quality and improved its validity. For example, during the systematic review the research team was supported by another PhD student (Sonia Khanom), who played a valuable role in the quality check stage to improve the quality and validity of the data. In the acceptability study, we had a practitioner health psychologist (Dr. Eleanor Bull) as part of the research team for the analysis process. Furthermore, throughout the entire thesis, the researcher shared insights and interactions to assist the reflection of the researcher regarding their position and involvement in the research process. For example, in the acceptability study, the researcher benefitted from clinical supervision throughout the recruitment process.

- **Reflexivity**: It is important to understand that qualitative research is contextual, occurring between two or more people at a specific time and place. To understand the context of the research space, the researcher must clearly show us all these elements. Therefore, reflexivity is considered key in maximising the trustworthiness of the qualitative results. This

involves the researcher taking time to reflect on their role and the impact of their personal context on the qualitative research (Dodgson, 2019). The researcher kept a journal in which she reflected on her own beliefs and thoughts about the study. This was supplemented with regular meetings with the supervisory team, in which beliefs and thoughts were shared and discussed as part of an active, ongoing process to ensure the validity of the results. General reflexivity is reported at the end of the discussion section.

3.9 Patient and public involvement

Researchers, scientists, and knowledge users operated independently for many years, resulting in a "knowledge-action gap." This led to knowledge users largely ignoring or dismissing research findings (Atkinson-Grosjean, 2006; Cooke et al., 2021). In order to bridge this gap, several attempts have been made, with knowledge co-production being the most notable (Cooke et al., 2021). A co-production approach involves researchers, practitioners, and the public sharing power and responsibility throughout a research project, including its generation of knowledge (Coldham & Group, 2018). Patient and public involvement informs the co-production approach.

The literature highlights the great importance of the engagement of public, patients and other stakeholders in the research process (Domecq et al., 2014; Shippee et al., 2015). Patient and public involvement (PPI) refers to the active interaction/engagement between patients and/or members of the public and researchers (Warner et al., 2021; Wilson et al., 2015). The National Institute for Health and care research (NIHR), provided definitions for this approach. They define public involvement in research as "*an active partnership between patients, carers and members of the public with researchers that influences and shapes research"* (NIHR, 2021). They also refer to engagement as the different ways the results of research, information and knowledge produced can be shared with or disseminated to the public (NIHR, 2021). Compared to the concept of participation where they refer to the different ways people take part in the research including, taking part in clinical trial, completing a questionnaire or participating in a focus group (NIHR, 2021). They provided a clear distinction between involvement, engagement and participation. In this thesis, participants were involved in the research in many different ways.

From the early stages of the PhD, there was an awareness of the importance of PPI when focusing on vulnerable groups within society, such as refugees. It is recommended in the literature to involve various stakeholders, including PPI representatives, early in the research

process in order to establish priority research areas that are meaningful to patients, as well as clinicians and researchers. The topic of this PhD was informed by the results of previous research during the main researchers MSc, from which this PhD stemmed (Alsubhi, 2017). Moreover, PPI involvement was integrated into each stage of the research in different ways which was discussed in detail in 2.7.2 section.

3.9.1 The importance of patient and public involvement in refugee research

It is important to distinguish between involvement and participation in research, as involvement of patients/members of the public actively provides advice and contributes to the development of the research process (Warner et al., 2021; Wilson et al., 2015). Patient representatives can improve the research conducted in their area, as they often have better insights and judgement regarding the challenges they face, based on a deeper understanding of their circumstances. For this reason, PPI input can be extremely valuable, particularly among vulnerable groups, revealing original thoughts regarding their health outcomes that might never have occurred to researchers in this area.

Research development that involves 'vulnerable' groups, such as refugees, can be challenging (Block et al., 2013). According to Block and colleagues, research that focused on vulnerable and marginalised population groups such as refugees, involved many ethical and methodological challenges. These challenges includes, power differentials, cultural and linguistic differences between the researcher and participants, participants' limited English proficiency, their lack of familiarity with research processes, emerging potential for research-related harms, capacities to give informed consent, the range of planned research activities, and the quality of data being collected. All of these challenges should be kept in mind when designing and conducting research with populations such as refugees.

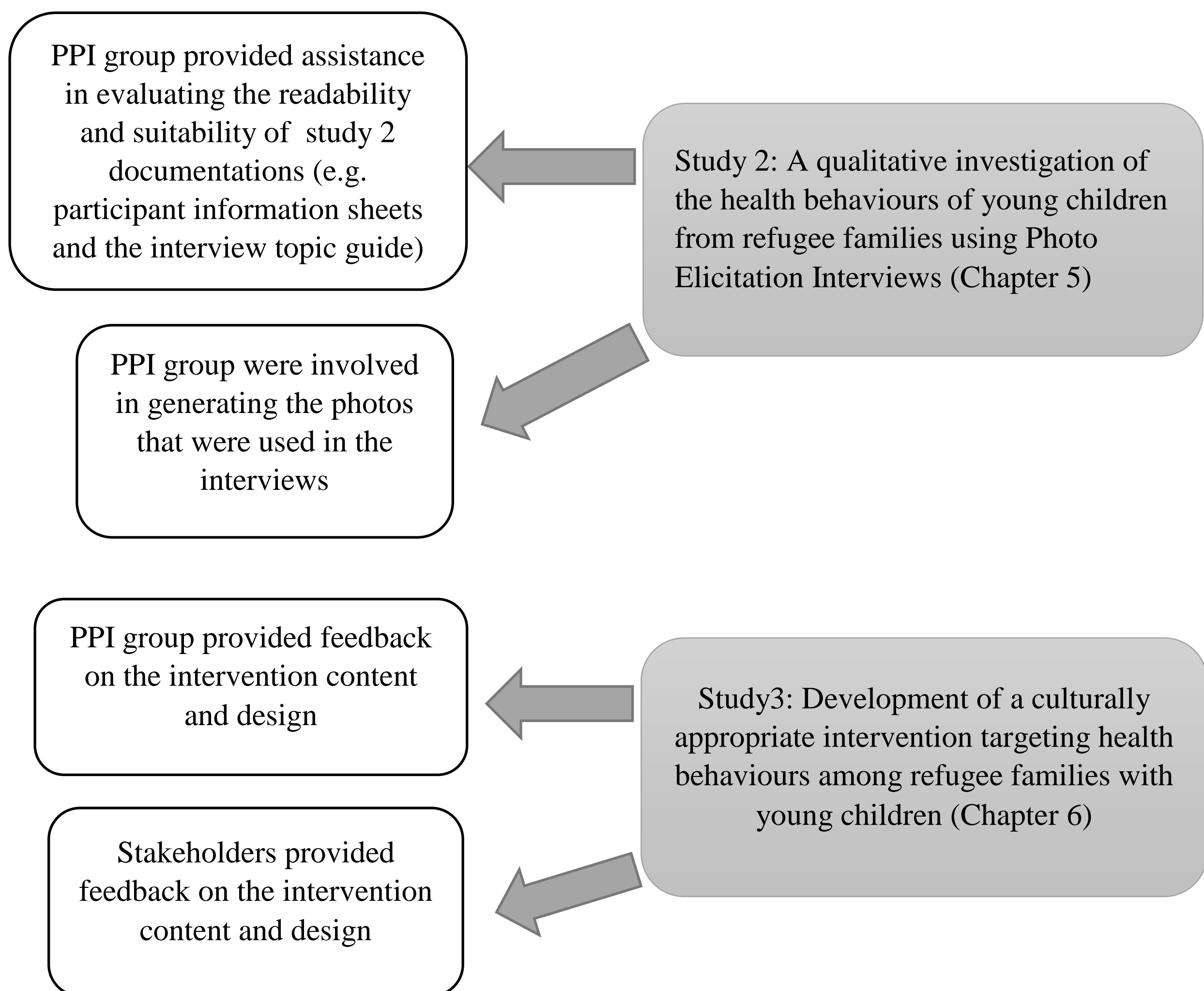
The involvement of the public can have a transformative effect on efficacy and outcomes. Involving PPI in refugee research can yield numerous benefits, including increasing research accuracy, helping to overcome stigma, providing inclusive communications about conditions and, most importantly, helping to inform effective and sensitive recruitment strategies, as well as providing the basis for truly informed consent (Warner et al., 2021). Involving refugees as PPI contributors can help overcome many obstacles that are common when doing research with vulnerable groups, potentially informing a study with the appropriate language, culture,

religion, and social norms, as well as offering a deeper understanding of their experiences of oppression and stigma (Warner et al., 2021). PPI involvement is important in designing an intervention that is culturally and linguistically appropriate.

3.9.2 Patient and public involvement (PPI) at each stage

This section will discuss in detail the nature and degree of PPI involvement at each stage of this PhD. An overview of PPI involvement can be seen in Figure 3.2 :

Figure 3.2. Overview of PPI within this PhD



3.9.2.1 Study 2: A qualitative investigation of the health behaviours of young children from refugee families using Photo Elicitation Interviews (Chapter 5).

In this study, refugee parents were invited to participate in the research. Photo elicitation interviews were used, allowing refugees to be actively involved on two levels: generating the images and evaluating the study materials. Three refugee mothers of young children were

purposely selected to reflect the targeted population, specifically members of a group with specifically defined characteristics.

In the first phase, the PPI group provided assistance in evaluating the readability and suitability of the participant information sheets and the interview topic guide, with a focus on assessing the clarity and accessibility of these documents for the targeted sample population. The discussions with the mothers resulted in several changes being made to the participant information sheets, including further explanations of the study aims and the provision of examples of health behaviours (e.g., healthy diet, being physically active). The refugee mothers also helped assess and formulate some of the interview questions. This was important, as interview questions are essential for eliciting rich responses and are most effective when participants are able to fully understand the meaning of the questions.

In the second phase, the PPI group were involved in generating the photos that were used in the interviews. This was important to ensure that these pictures accurately reflected the daily lives of refugee families after their resettlement in the host country. This second phase of PPI support occurred in two stages:

First stage:

Examples of photos were generated to reflect the daily lives of refugee families after their resettlement in the host country (e.g., meal time, shopping practices, home environment, examples of types of physical activity during the week, and eating behaviours), which was informed by discussions with and the assistance of the research team (three experts in health psychology and behaviour change). These photos were generated as part of the guidance given to the PPI members to provide an example of the type of photos that they needed to generate and the range of topics that they needed to cover. Ethical considerations of the content of the photos were taken into account, such as PPI being asked to only share photos where their children could not be identified from the pictures.

Second stage:

Three mothers agreed to participate as the PPI contributors. These individuals represented the targeted population and were considered eligible according to the inclusion criteria, which

included 1) refugee parents (mothers and fathers) aged 18 or above; 2) have young children aged 2-12 years old; and 3) have been resettled in the UK for more than three years. This PPI group were involved in generating and selecting the photos that would be used in the interviews, as well as reviewing the topic guide and information sheet. At the PPI meetings, the researcher gave a brief outline of the rationale of this study, then provided guidance on the type of photos that needed to be generated and the desired topics and content of the photos. The example photos were presented to the PPI contributors, who were then asked for their assistance in generating more realistic photos that would then be used in the interviews. The PPI contributors generated the majority of the photos used in the interviews. The final selection of photos was a result of a two-stage process, with the PPI contributors generating the photos and then participating in a discussion regarding the final selection of photos, which followed all the ethical considerations. A final decision was made by the research team on the numbers and specific photos that would be used in the interviews.

3.9.2.2 Study 3: Development of a culturally appropriate intervention targeting health behaviours among refugee families with young children (Chapter 6)

Refugee parents were involved throughout the intervention design process from the beginning. Several meetings were held with (N=7) mothers of young children; the meetings were held in the refugee organisation. These meetings involved the discussion of key elements relating to the intervention: 1) the targeted health behaviours; 2) the components of the intervention; 3) content appropriateness; and 4) the cultural sensitivities of the intervention. These meetings were conducted in their own language, which was Arabic. The first meeting included a presentation of the results from the qualitative study and the COM-B analysis, a discussion of the aims of the next stage of the PhD (designing an intervention), a group discussion regarding the targeted behaviours (snacking, sedentary behaviours), and the provision of examples of different components of the intervention (example of types booklets). Discussions were also held on usability and content appropriateness, as well as the different options available for mode of delivery. The aim of these meetings was to ensure that the intervention was tailored in a culturally and linguistically appropriate way. All the PPI groups were compensated for their time by the provision of a high street gift card worth £10.

Stakeholders were also involved in the process of developing and refining the intervention. Two meetings were held with support workers employed at the refugee organisation. These meetings included discussions around potential different opportunities within the organisation

regarding the delivery of the intervention, as well as potential opportunities for social workers as providers of the intervention. Discussions also involved an assessment of the feasibility and suitability of certain dimensions of the intervention, such as provider (who delivered it); setting (where it was delivered) and duration (Michie et al., 2014, p. 176). These discussions took place during the first few stages of intervention development.

This step was deemed necessary due to the findings of previous research, which show that involving stakeholders as both participants and contributors can assist in successfully contacting and working with 'hard to reach' populations (Morgan et al., 2016), such as refugees. This involvement has proven to enhance "equality and acceptance, and knowledge gain" of the intervention and ensure the empowerment of participants regarding the intervention (Warner et al., 2021). Therefore, refugee involvement in developing culturally appropriate interventions was considered essential.

3.10 Recruitment challenges

As anticipated, the recruitment process was challenging, since the research involved refugee parents, who are considered a hard-to-reach population (de Vries et al., 2017). However, several strategies supported the recruitment process. During the study, the researcher volunteered within a refugee organisation for a year during her PhD. This opportunity allowed me to observe the different ways this population interacts with key authority figures and provided a deeper understanding of the challenges these parents face on daily bases. My role involved facilitating and organising a "Baby and moms" group which involved activities relating to the health and lifestyle in the UK. Working on facilitating and helping translation provided me with knowledge and understanding of the appropriate ways to overcome the challenges that I might face in recruiting this population.

This experience substantially contributed in building rapport with participants, which played an important role in supporting data collection. Building rapport helps participants to feel comfortable to share information and open up during the interviews (Aronson, 2010; Clarke & Braun, 2013; Reinharz & Chase, 2002). However, a potential disadvantage of a good rapport is that it can lead to participants trying to please the researcher in order to maintain the positive image and relationship. In the current study, this was not an issue as most of the participants were not regular visitors to the organisation and parents seemed to be open and honest in their responses. Recruitment was also supported by a high degree of flexibility and time investment, with the researcher allocating plenty of time to conduct the interviews and offering many

options regarding the interview locations (e.g., refugee organisation, local libraries, and quiet rooms in the university). This was informed by the previous experience of volunteering within the refugee organisation and was planned by the researcher to have enough time for recruitment. This level of flexibility was a vital component in the recruitment, enabling twenty -seven interviews to be conducted with refugee parents. However, that was not enough in to enhance the recruitment of fathers which was even more challenging. Fathers remain largely underrepresented in the parenting and family literature despite advances in understanding the importance of father involvement, the situation is especially problematic for immigrant and refugee fathers. That was true for our study where only three fathers were recruited to the study, reflecting many commonly cited issues (Bond, 2019). Among the challenges they face as fathers are underemployment, lack of social support, and racism (Bulford et al., 2022; Forget et al., 2019). As a result, many of them saw their culture's expectations and values of fatherhood as different from those in their new country (Bulford et al., 2022; Este & Tachble, 2009; Merry et al., 2017). These challenges might act as barriers for fathers' engagement in research. This was supported by Forget, Correa-Velez, Dee, 2019 research where they explained how challenging it was to recruit fathers from a refugee background. The researchers emphasised that reaching vulnerable fathers, such as refugee fathers, requires well-established networks, ample time, and a high degree of flexibility (Forget et al., 2019). It has been recognised that building a trusting relationship with hard-to-reach populations can be time consuming and this is particularly true of refugee fathers. Furthermore, the interview process requires openness and honesty about a variety of sensitive topics, such as parenting, gender roles, and the situation in their new country, potentially leading to feelings of shame and guilt stigma (Phares et al., 2006). Multiple fathers informed the researcher that talking to their wives would be more appropriate, citing insufficient time and a belief that their parental role was less important than that of their partners. Some fathers assumed that since the main researcher is a woman, she would want to speak to their wives instead of them even after it was explicitly stated she would want to speak with them. This clearly suggests the gender effect on the recruitment process, reflecting similar findings in the literature regarding studies working with populations from specific cultures, such as refugees from the Middle East. This was supported by a study that highlighted refugees' perspectives regarding participation in health research, they concluded that the gender of the researcher may influence participation. They stated that participants tended to prefer the same gender when it came to more sensitive topics, which may be mediated by the type of research questions (Gabriel et al., 2017). Therefore, it was

recommended to use research assistants who are the same gender as the target population when working on sensitive research topics (Gabriel et al., 2017).

Previous studies have highlighted the importance of ensuring that the researcher and participants are of the same gender to ensure equality in the power dynamic, particularly for female research participants discussing sensitive health issues (Redman-MacLaren et al., 2014). This reflects invisible power and gender dynamics, as well as cultural norms. This effect of gender on qualitative research has been shown in the literature (Lefkowich, 2019; Powell, 1987). Therefore, recruiting fathers needed a different strategy which involved the help of the mothers, and extra help from professionals working with refugees.

3.11 The importance of translation in refugee research

From the beginning of the study, it was clear that working with refugee populations must involve a high deal of cultural and linguistic sensitivity. Therefore, all the study materials used in the study were translated into Arabic to overcome the language barrier among this population. Arabic was chosen since the majority of refugees who have resettled recently were from Middle Eastern countries. Participants were given the option to be interviewed in English or Arabic and 26 of the 27 parents elected to conduct their interview in Arabic, with only one choosing English. This illustrates the importance of offering the mother language of the population under study to encourage parents to speak freely about their experiences and to increase trust in the researcher (Lee et al., 2014). Data from the interviews were audio-recorded with the consent of participants and then transcribed verbatim, directly into English. To ensure translation quality assurance a professional translator conducted a comprehensive, independent cross-check (Van Nes et al., 2010; Wong & Poon, 2010).

1.12.Chapter overview

This chapter has provided an overview of the qualitative method approaches and qualitative synthesis adopted within this PhD. Justification has been provided for the chosen methods, including the data collection methods of semi-structured interviews and photo-elicitation. This chapter has also included justification for, and some further detail regarding, the data analysis methods used, which were primarily thematic analysis and deductive analysis. The next chapter provides further details on the results of each study.

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Chapter 4. What factors are associated with obesity-related health behaviours among child refugees following resettlement in developed countries? A systematic review and synthesis of qualitative and quantitative evidence

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4.1 Abstract

Refugee children are likely to become less active and eat more unhealthily after their resettlement in developed countries. This review aims to identify and synthesise research about factors that influence unhealthy behaviours related to obesity in this population. Six electronic databases were searched systematically to identify studies that sampled refugee children or parents of refugee children aged 2-16 years who have resettled in a developed country. Methodological and cultural study quality was assessed, and factors associated with obesity-related health behaviours investigated. 20 studies fulfilled the inclusion criteria. Five major themes, representing factors influencing health behaviours, were identified from the data synthesis process: Acculturation, Environmental, Socioeconomic, Cognitive, and Family. The analysis revealed that refugee's health behaviours are influenced by several complex factors that are common to immigrant groups but have a greater influence amongst refugees. The review also revealed parental practices influence the health behaviours of children, especially those aged 2-10. Research is needed to understand further the role that parents have in influencing health behaviours and weight trajectories of children following resettlement.

4.2 Introduction

Obesity is an extremely important public health problem facing individuals, communities and governments(Richardson, 2018). The last decade has seen a marked rise in the prevalence of obesity rates worldwide, with incidence of overweight reaching epidemic proportions (Finucane et al., 2011) and threatening to outnumber global rates of undernutrition(Armstrong, 2011; Caballero, 2007). The increasing prevalence of global obesity has serious health implications for populations worldwide as it constitutes a major risk for chronic diseases, including type 2 diabetes, cardiovascular disease, hypertension and stroke, as well as certain forms of cancer (Flegal et al., 2010). Importantly, although it is more common among adults, a marked rise has also been observed in the incidence of obesity in children (Grijalva-Eternod et al., 2012b).

Rising levels of childhood obesity constitutes one of the most serious public health challenges in the modern era (WHO, 2018a). Although this trend has been observed globally, the increase in overweight children and adolescents is especially evident in economically developed countries(Popkin, 2010). There are many negative physical, social-emotional, psychological and academic effects associated with childhood obesity. Short term repercussions include hypertension, dyslipidaemia, orthopaedic problems, and poor quality of life, while longer term health impacts include cardiovascular disease and diabetes (Freedman et al., 2007; Pinhas-Hamiel & Zeitler, 2007; Taylor, 2006). Childhood obesity, and its associated increased health risks often persists into adulthood (Biro & Wien, 2010; Whitaker et al., 1997).Increased childhood obesity has been observed across populations however, data show a particularly rapid rise in the prevalence of obesity among children in low-educated, low-income families, as well as among immigrant groups and refugees who have settled in developed countries (Singh et al., 2009). This suggests that different or additional factors may be operating for these individuals and a different approach may be required to reduce the risks of obesity.

Forced migration is a life-changing process for refugees. A refugee is defined as any person who is forced to leave their home country due to "*fear of being persecuted for reasons of race, religion… and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country*" (UNHCR, 2015, p. 12). As such, refugees can be differentiated from immigrants who leave their home country following planned migration. At least 13 million children live as refugees or asylum seekers outside their home country, most of whom originate from Asia, the Middle East or Africa (Commission, 2018

).Many refugees, especially children, are exposed to considerable health risks on these dangerous and often prolonged journeys, reaching host countries suffering from the effects of undernutrition, infectious disease, and poverty (Kadir et al., 2019; Lutfy et al., 2014; Renzaho et al., 2006b). Although their health and weight typically improves post-resettlement, their health tends to decline in the longer term, possibly as a result of adopting the unhealthy health behaviours that may relate to the culture of the country in which they resettle (Yip et al., 1992). The profound alteration of lifestyle, associated with resettlement in developed countries has numerous attendant challenges for refugees, including adaptation to the local food environment (Alsubhi 2017; Anderson et al., 2014). The processes involved in acclimatising to a new environment can negatively affect the general health of refugees, manifesting in a range of negative outcomes (Anderson et al., 2014; Dharod et al., 2013). For example, it is argued that the challenges in navigating the obesogenic lifestyle associated with some economically developed societies during resettlement can increase the risk of childhood obesity (Patil et al., 2010).

Ethnicity and acculturation have been identified as factors that contribute to health inequality and so function as determinants of diet and lifestyle among migrants. A number of studies have focused on the role of acculturation (i.e., the process of adopting the cultural norms and practices of a host society) in studying obesity and the associated health decline of immigrant and refugee populations (Tiedje et al., 2014). Previous studies have demonstrated a connection between acculturation and increased risk of obesity and cardiovascular disease, with sub-optimal dietary behaviours mediating this connection (Padilla et al., 2011). Other studies highlight important ethnic differences in cardiovascular disease risk factors among immigrant populations, which demonstrate the connection between ethnicity/acculturation, diet and the risk of cardiovascular disease (Syme et al., 1975). These findings also suggest that each ethnic group may have a distinct trajectory related to the lifestyle in their country of origin and their level of acculturation in their host country. This difference between lifestyles in the country of origin and reception may explain why obesity trajectories can be expected to be diverse in refugee children. This is especially important given that obesity rates differ greatly between high income countries, which may be attributable to differences in diet and levels of physical activity. However, other research reveals the limited extent of acculturation theory to clarify the differences and changes between refugee and immigrants as well as the factors underpinning health inequality among refugee populations (Tiedje et al., 2014).

There is evidence that refugee children have poorer health outcomes than other migrant children. Refugees relocating to the USA report more adverse physical health outcomes (e.g., heart disease, hypertension, and type 2 diabetes), and become more overweight and obese than non-refugee immigrants (Grigg-Saito et al., 2008; Keita et al., 2016; Peterman et al., 2011; Sorkin et al., 2008). One explanation for this is that refugees experience greater stress prior to (e.g., stress related to armed conflict), during migration (i.e., the actual journey) and after settlement (e.g., insecure and transient accommodation) than migrants (Franzen & Smith, 2009; Peterman et al., 2010; Willis & Buck, 2007). The trauma and stress associated with the refugee experience increases the risk of chronic disease (Boscarino, 2004; Kang et al., 2006; Palinkas & Pickwell, 1995). The reasons for this are unclear but it is likely that the stressors involved in being refugee influence obesity related health behaviours during resettlement. For example, refugee children who have undergone long-term dietary limitation in refugee camps may adopt health behaviours that are associated with obesity development, such as increased consumption of processed and energy-dense foods, and corresponding decreased consumption of fish, fruit and vegetables (Sastre & Haldeman, 2015; Tiedje et al., 2014; Wang et al., 2016). It is important to systematically synthesise the existing literature to obtain a deeper understanding of the complex factors that contribute to unhealthy weight change, specifically among refugee children (Sulaiman-Hill & Thompson, 2011).

To date, there are limited data focusing on the factors associated with behaviour changes and obesity among refugee families after their resettlement. The interaction between ethnicity/acculturation and refugee stress is poorly understood (Dunn & Dyck, 2000; Malmusi et al., 2010); this may be due to the associated methodological difficulties involved in studying this hard-to-reach population (Cortis et al., 2009; UNHCR, (2014, March)). The reluctance of refugees to become involved in research, as well as the likelihood that individuals will move after resettlement make it difficult to obtain necessary sample sizes and to obtain follow up data. Other methodological challenges include the difficulties in ascertaining the legal status of refugees, because most organisations that support minorities tend to group immigrants and refugees into a single category (Sulaiman-Hill & Thompson, 2011). Moreover, some refugees are worried about revealing their legal status.

Consequently this review sought to contribute to existing knowledge by obtaining a deeper understanding of the complex factors that influence obesity-related health behaviours in refugee children after their resettlement in developed countries. Specifically, it aimed to identify the factors associated with health behaviours in this population, as well as identifying

those areas that would benefit from further research. Insights in this area could provide important information for local services, and national and international policy, enabling the provision of the best support for this vulnerable population, as well as informing the design and development of interventions to tackle this problematic trend.

4.3 Methods

This systematic review is reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)(Moher et al., 2009) and was pre-registered (PROSPERO CRD42018096940).

4.3.1 Inclusion and exclusion criteria

The studies that met the following inclusion criteria were included (see Table 4.1).

Table 4.1. Inclusion and exclusion criteria

Inclusion criteria	**Exclusion criteria**
• Primary research • Studies on refugee children (aged 2-16) or refugee parents with young children in this age group • Studies where refugee children are at least 30% of the total sample size when they are combined with immigrant samples • Studies conducted between 2003 and August 2018.	• Secondary research • Studies that focused exclusively on adult refugees with no child participants. • Systematic reviews and meta-analyses. • Studies including migrant children without a refugee background • Studies published in abstract form only.

4.3.2 Search Strategy

Six electronic databases were searched for eligible studies, (CINAHL, MEDLINE, EMBASE, PsycINFO, Web of Science, and Scopus). Unpublished studies were searched using OpenGrey. Ascendancy and descendancy searches were conducted on the reference lists of relevant reviews and studies. In addition, researchers in relevant fields were contacted for assistance in identifying studies, in order to ensure that the main studies in this area were included.

4.3.3 Search terms

The Sample, Phenomenon of Interest, Design, Evaluation, and Research type (SPIDER) framework (Cooke et al., 2012) was adopted and used to direct the development of the search terms. See Table 4.1 for the main terms used in this review. The search terms were modified according to the database and combined with Boolean operators (AND/OR/NOT). Searches were limited to the years from January 2003 to August 2018 and human studies.

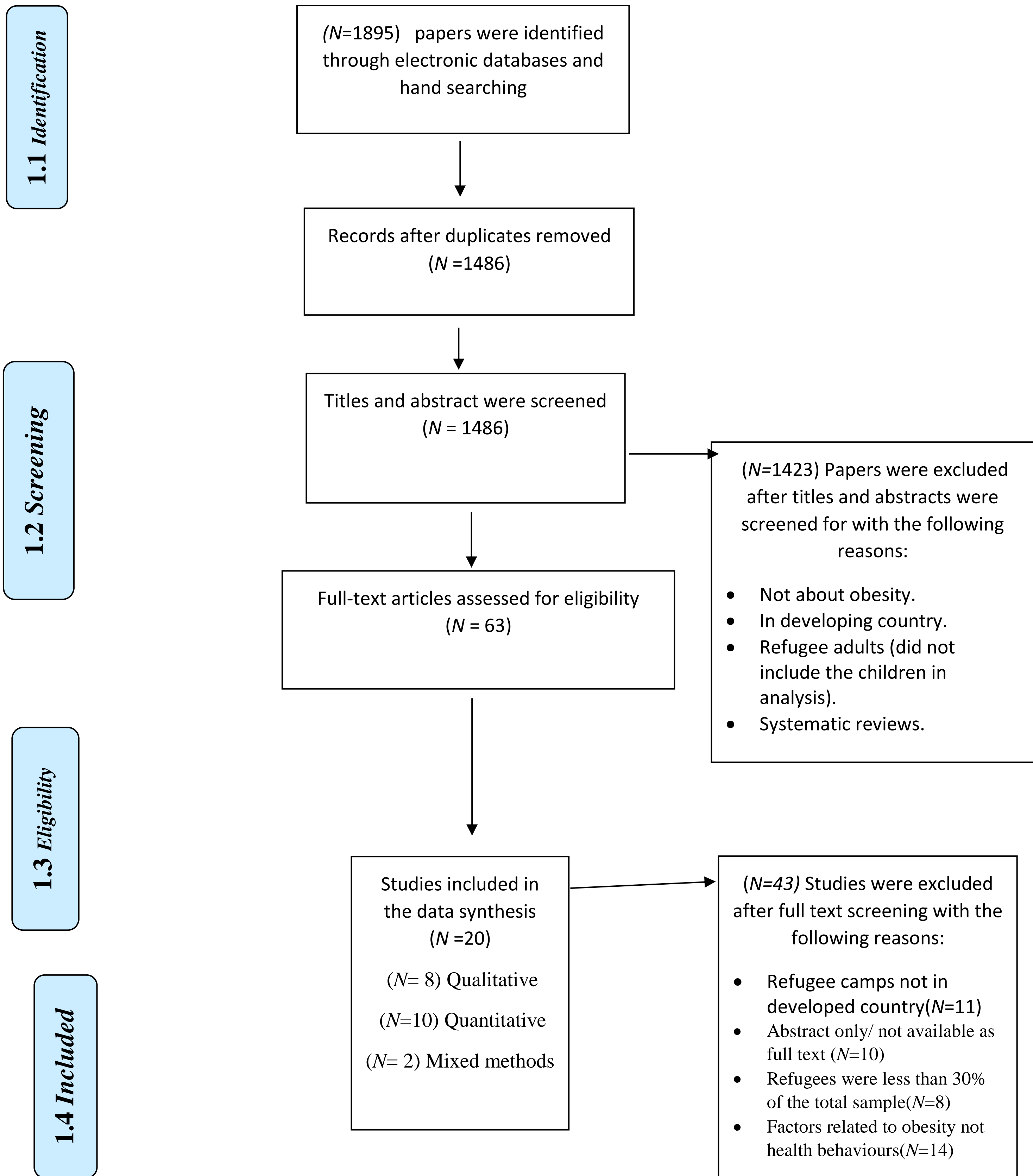
Table 4.2. The Sample, Phenomenon of Interest, Design, Evaluation, and Research type (SPIDER) framework.

SPIDER	Search terms
Sample	Refugee* OR Forced migrant OR Forced displace* OR involuntary migrant
Sample	Child* OR Minor OR young OR youth OR Parents OR young person
Phenomenon of Interest	Health behavio*OR Health adj2 Behavio*OR Diet OR Nutrition OR Food intake OR eating behavio*OR eating OR Fruit OR Vegetables OR Healthy eating OR Healthy diet OR Lifestyle behaviour OR physical activity OR Physical adj2 Activity OR Feeding practices OR Exercise OR sedentary OR screen time OR obes* OR overweight OR weight gain OR Feeding behaviour OR Eating patterns

4.3.4 Study selection

The study selection process occurred over several stages: duplicates were removed, then each title and abstract was screened for inclusion by two reviewers (MH) and (SK) with reference to the inclusion criteria. Full texts of promising studies were subsequently reviewed against the inclusion and exclusion criteria by same two reviewers. Any disagreements were resolved through consultation with a third reviewer. See Figure 4.1 for a PRISMA diagram depicting the process of selecting studies.

Figure 4.1: The study identification and selection process



4.3.5 Assessment of methodological quality

The quality of the quantitative studies was assessed using a quality-appraisal tool that used six methodological questions (rating the sampling methods, response rate, primary/secondary data source, validity/ reliability of the measures used, data quality and the definition of the problem) see Table 4.3 (Louw et al., 2007). The methodological quality of qualitative studies was assessed using ten evaluation criteria of the Joanna Briggs Institute (JBI) approach(Lockwood et al., 2015).

Given the focus on refugee children, who represent several ethnic groups, assessment was also conducted into the 'cultural quality' of each ethnic group in the studies. The cultural quality assessment considers the cultural, social and linguistic needs of a highly diverse population during the development of the research ideas, designing, conducting research and exploring the applicability of research findings (Nazir, 2015; O'Brien et al., 2006; Waheed, 2010a). This tool has been used in previous systematic reviews on ethnic minorities. It covers twelve areas (Were any of the authors from the same ethnicity background of the participants?, Was the ethnicity of the target population defined?, Were special considerations used in selecting the measuring tool?, What languages were offered?, , What was the process of translation?, Was there ethnic matching of interviewers and interviewees?, Was there cultural consideration in interviewer/interpreter training?, Was the interviewee's family consulted?, Were community agencies consulted?, Were interpreters used?, Was the validity and reliability of translated questionnaires tested?) (Nazir, 2015; Waheed, 2010a).

Table 4.3: Methodological Quality Appraisal Tool

1	Sampling method: Was it representative of the population intended in the study?	A. Non-probability sampling (including: purposive, quota, convenience and snowball sampling)	0
		B. Probability sampling (including: simple random, systematic, stratified g, cluster, two-stage and multi-stage sampling)	1
2	Was a response rate mentioned within the study? (Respond no if response rate is below 60)	A. No	0
		B. Yes	1
3	Was the measurement tool used valid and reliable?	A. No	0
		B. Yes	1
4	Was it a primary or secondary data source?	A. Primary data source	1
		B. Secondary data source (survey, not designed for the purpose)	0
5	Was either of Health behaviours (Physical Activity or diet "eating patterns" or obesity outcome looked at within the study?	A. No	0
		B. Yes	1
6	Was the relationship/association between different factors and Health behaviours (Physical Activity or diet " eating patterns") explored?	A. No	0
		B. Yes	1

Scoring: Total score divided by total number of items multiplied by 100					
Methodological Appraisal Score:					
Bad	0 – 33 %	Satisfactory	34 – 66 %	Good	67 – 100%

All studies meeting inclusion criteria were included in this review regardless of their quality because some of the lower-rated papers contributed different insights; however, their findings were treated with caution.

4.3.6 Data extraction

The results of the literature search was managed using the EndNote reference management software. Data were extracted from the studies using a data extraction tool by one author (MA). For the qualitative studies, all quotes from participants, results and discussion sections were extracted and uploaded to NVivo11 software.

4.3.7 Data synthesis

A separate synthesis for qualitative and quantitative studies was conducted, in which thematic synthesis and narrative synthesis were conducted, respectively. The initial synthesis revealed that five themes extracted from all studies were similar, therefore; a narrative synthesis approach using text and tables was employed to compare and combine the results of the thematic and narrative synthesis (Popay et al., 2006).

4.4 Results

A total of 1892 papers were identified (see Figure 4.1). After duplication and title/abstract screening, 63 potentially eligible studies were retrieved for full text screening. Twenty fulfilled the inclusion criteria and were included in the review (see Tables 4.4-4.6).

4.4.1 Study characteristics

The final set of studies comprised eight qualitative, ten quantitative and two mixed methods studies. Half focused exclusively on the perception of parents regarding the diet and physical activity of their children; the remainder obtained insights from refugee children themselves. Half of the studies focused their research questions on acculturation as the main factor influencing diet change (Griffith et al., 2014; Keita et al., 2016; Patil et al., 2009a; Peterman et al., 2011; Renzaho et al., 2006b; Renzaho et al., 2008b; Rondinelli et al., 2011; Vue et al., 2011; Wilson & Renzaho, 2015; Wilson et al., 2010a; Wilson et al., 2010b). Three studies focused on food insecurity, particularly in terms of eating patterns among refugee children (Anderson et al., 2014; Dharod et al., 2013; Patil et al., 2009a). Three (Cyril et al., 2016; Mellor et al., 2012; Renzaho et al., 2011) studies investigated the link between family functioning / parenting style and childhood obesity, and a single study explored the association between negative mood and health behaviours among refugee parents and their children. The remaining studies explored a range of migration-related elements associated with health behaviours. The included studies involved a diverse range of ethnicities; the majority focused on refugees originating from countries in three distinct regions: Southeast Asia (Laos, Vietnam, Cambodia, and Hmong refugees), sub-Saharan Africa (Sudan, Somalia, Democratic Republic of the Congo, Burundi, Djibouti Kenya, Tanzania, Eritrea and Ethiopia), and Middle Eastern countries (Afghanistan, Iran, Iraq). Most of the studies were conducted in Australia (Gichunge et al., 2016; Griffith et al., 2014; Mellor et al., 2012; Renzaho et al., 2006b; Renzaho et al., 2011; Renzaho et al., 2012b; Renzaho et al., 2008b; Wilson & Renzaho, 2015; Wilson et al., 2010a) or the USA (Anderson et al., 2014; Dharod et al., 2013; Keita et al., 2016; Morrison et al., 2017; Patil et al., 2009a; Peterman et al., 2011; Rondinelli et al., 2011; Tiedje et al., 2014; Vue et al., 2011; Wieland et al., 2015b). No study was conducted in the UK.

Table 4.4. Overview of the Quantitative Studies

Authors	**Country**	**Objective**	**Study design**	**Participants and Ethnicity**	**Instrument(s) used**	**Factors in Research Question**	**Main results (Whether Outcomes presented by ethnicity?)**
Renzaho & Burns (2006)(Renzaho et al., 2006b)	**Australia**	(I) To describe sub-Saharan African (SSA) post-migration food habits and eating patterns; and (ii) to examine how the food habits of SSA households in Victoria reflect post-migration Acculturation. To describe sub-Saharan African (SSA) post-migration food habits and eating patterns.	Cross-sectional	(*n*=of 139) sub-Saharan African migrants and refugees **Of the sample 54% Refugees.**	• Data on food habits and eating patterns were obtained using semi-structured, face-to-face interviews	• Post-migration experience • Acculturation	• Data is not reported separately by ethnicity **Factors most influencing food choice:** • Nutritional value • Budget • Health • Preference/favourite • Easy to prepare • Cultural/traditional • Availability of ingredient • Religion

Authors	**Country**	**Objective**	**Study design**	**Participants and Ethnicity**	**Instrument(s) used**	**Factors in Research Question**	**Main results (Whether Outcomes presented by ethnicity?)**
		To examine how the food habits of SSA households in Victoria reflect post-migration acculturation.					
Renzaho, Swinburn, & Burns (2008)(Renzaho et al., 2008a)	**Australia**	To examine the association between acculturation and obesity and its risk factors among African migrant children in Australia.	Cross-sectional	(*n*=337) sub-Saharan African migrant children aged 3–12 years.	• Body mass index (BMI), leisure-time physical activity (PA) and sedentary behaviours (SBs) and energy density of food.	Cultural factors	• Data is not reported separately by ethnicity • Maintenance of traditional orientation was associated with lower rates of obesity and sedentary behaviours.
Mellor, Renzaho,	**Australia**	Investigates the relationship between	Cross-sectional	(*n*=104) Sub-Saharan	• The Alabama Parenting	• Parenting style	• Data is not reported separately by ethnicity

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
Swinburn, Green& Richardson (2012)(Mellor et al., 2012)		parenting style and family function and the BMI of adolescent African refugees		African refugee families with the exception of three immigrants' families.	Questionnaire (APQ) was used to measure parenting style. • The Family Adaptability and Cohesion Evaluation Scales IV (FACES IV) was used to measure family functioning	• Family functioning	• Scores on positive parenting style were significantly higher among parents than adolescents. • Parents perceived their family functioning as more fixable and cohesive than the adolescents believed it to be. • No significant relationship was found between parenting style, family functioning and BMI of adolescents.

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
Dharod, Croom, Sady (2013)(Dharod et al., 2013)	**USA**	To examine the association between food insecurity, dietary intake, and body mass index among Somali refugee women living in the United States.	Cross-sectional	(*n*=195) Sub-Saharan African refugee mothers from Somali of at least 1 child 12 years of age or younger	• Survey questionnaire that includes three main domains: 1-Socioeconomic and Acculturation Factors 2-Dietary Intake 3-Food Security	Food Insecurity	• Data is reported separately by ethnicity • Food insecurity was associated with higher intake of meat and eggs and lower intake of fruits and vegetables comparing to secure participants. • Food insecurity was positively related to overweight and obesity
Griffith, Mellor, Green & Renzaho (2014)(Griffith et al., 2014)	**Australia**	To examine migration- and socioeconomic-related influences on obesity among African migrant adolescents in Melbourne, Australia.	Cross-sectional	(*n*= 199) 100 adolescents and 99 parents from sub-Saharan African countries and from both migrant and	• Anthropometric data was collected. • Demographic and socioeconomic information collected.	• Acculturation • Socioeconomic status	• Data is not reported separately by ethnicity • Factors like gender, pre-migration life, environment and parental acculturation patterns have influence on developing overweight and obesity among

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
				refugee backgrounds were **refugee represents 48% of the total number of adolescents and 89% of the total number of parents.**	• Migration-related factors recorded. • Pattern of acculturation using the Acculturation, Habits, and Interests Multicultural Scale for Adolescents.		African migrant and refugee adolescents.
Anderson, Hadzibegovic, Moseley,	**USA**	To examine the relationship between household	Cross-sectional	(*n* = 60) refugee mothers of young children	• Household food insecurity (using the Radimer/Cornel	Food Insecurity	• Data is reported separately by ethnicity • Increasing severity of household food insecurity was associated with

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
Sellen (2014) (Anderson et al., 2014)		food insecurity and refugee mothers' and other caregivers' self-reported food intakes		from sub-Saharan African (Sudan).	l hunger scale) (Kendall et al., 1995; Leyna et al., 2008). • Food frequency questionnaire developed by the research team. • Tool to measure instrumental social support (Heaney & Israel, 2008). • Tool to measure attitudes toward traditional foods		decreased consumption of high-cost, high-nutrient-density food items and increased consumption of some low-cost traditional Sudanese foods by adult caregivers of young children.

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
					(Sellen & Tedstone, 2002).		
Gichunge, Somerset & Harris (2016)(Gichunge et al., 2016)	**Australia**	To examine the association between home availability and consumption of traditional vegetables among resettled African refugees living in Queensland, Australia.	Cross-sectional	(*n*=71) sub-Saharan African refugees.	• Questionnaire was used, comprising questions on demographics and socioeconomic characteristics, food environment and household food inventory (HFI). • Using a food frequency	Neighbourhood Factors and Socio-Economic Status.	• Data is not reported separately by ethnicity • Environmental factors like, language, lack of availability of traditional vegetables and lack of transport, have an influence on the type of food items consumed by resettled refugees. • Difficulty in access to and availability of food and vegetable has an influence consumption of the recommended serving of fruit and vegetable.

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
					questionnaire (FFQ).		
Cyril, Halliday, Green & Renzaho (2016)(Cyril et al., 2016)	**Australia**	To examine the difference between children and parental perception of family functioning, family communication, family type and parenting styles and their relationship with body mass index.	Cross-sectional	(*n*= 568) African parents and their children from both migrant and refugee backgrounds with an equal number of children and parents (284	• Family Communication was measured using the Revised Family Communication Pattern (RFCP) questionnaire. • Parenting style was measured using a single item scale developed by	Family functioning, family communication, family type and parenting style	• Data is not reported separately by ethnicity • There was a relationship between body mass index and family functioning, family communication, family type and parenting style. • A positive relationship between poor family functioning and child BMI.

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
				parents and 284 children).	(Radziszewska et al., 1996) • Family functioning was measured using the general family functioning subscale of the McMaster Family Assessment Device (FAD) (Miller, Epstein, Bishop & Keitner, 1985).		

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
Morrison et al. (2017)(Morrison et al., 2017)	**USA**	To examine the association between mood and physical activity level and nutritional habits in an immigrant population	Cross-sectional	(*n*= 151) Latino, Somali, and Sudanese refugees and immigrants (70 adults, 81 adolescents) **60% of the total sample were refugee.**	• An emotional well-being quality of life item(Singh et al., 2014) • Food Behaviours Checklist(Murphy et al., 2001) • The kinetic activity monitor (KAM) accelerometer (Abel et al., 2008) • Measuring Self-Efficacy and	Negative mood	• Data is not reported separately by ethnicity • Negative mood was associated with low physical activity level and poor nutritional habits in adolescent and adult immigrants.

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(s) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
					Social Support for Health Behaviours Change using : • Assessment and Counselling for Exercise plus Nutrition (PACE+) (Patrick et al., 2001) • Physical well-being quality of life scale(Locke et al., 2007)		

Table 4.5. Overview of the Qualitative studies

Authors	Country	Objective	Study design	Participants and Ethnicity	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
Rondinelli et. al, (2011)(Rondinelli et al., 2011)	**USA**	To explore nutrition-related health concerns associated with resettlement	Qualitative (using in-depth interviews)	Total (*n* = 40) participants **(*n* = 16),refugee** from Middle East countries (Afghanistan, Iran, Iraq) and sub-Saharan African (Sudan, Somalia) (*n*= 14) refugee service organization and (*n*=10) health care provider participants.	• Neighbourhood Factors • Acculturation • Socio-Economic Status	• Data is not reported separately by ethnicity ***The analysis identify four possible factors that have an influence on their health:*** • Past eating habit. • Level of acculturation • Socio-Economic Status • Neighbourhood environment • Lack of Food Choice Familiarity and Nutritional Knowledge
Vue, Wolff, Goto (2011)(Vue et al., 2011)	**USA**	To examine perspectives on food habits, acculturation, and health among Hmong women with	Qualitative (using semi structured interviews)	(*n*=15) Hmong refugee , mothers with young children	Acculturation	• Data is reported separately by ethnicity • The importance of Hmong food culture as it represents their identity, healthful lifestyle and social support.

Authors	Country	Objective	Study design	Participants and Ethnicity	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
		young children in northern California.				• Differences between American and Hmong Food Culture and its impact on nutritional health. • Different level of acculturation has an influence on the type of food children and their mother consume. • Children adopted American diet as results of the effect of American lifestyle.
Renzaho, McCabe & Swinburn (2012)(Renzaho et al., 2012a)	**Australia**	To explore differences in adolescent and parent perspectives toward health behaviours related to body-size perceptions among African refugee and	Qualitative (using semi structured interviews and focus groups).	(*n*=48) Refugee parents and adolescents from sub-Saharan African (Sudanese (South Sudan), Somali, and Ethiopian)	sociocultural factors	• Data is not reported separately by ethnicity • Parents perceive large body size as sign of wealth and beauty and small body size as sign of poor health and poverty. • Young people perceive slimness and small body size as the ideal body size which was endorsed by their peers.

Authors	Country	Objective	Study design	Participants and Ethnicity	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
		migrant parents and adolescents.				• Parents used strategies to promote weight gain in children like tailoring their food practices and restricting children's involvement in physical activity. • Children adopted strategies to resist parental pressure to gain weight.
Tiedje et al. (2014)(Tiedje et al., 2014)	**USA**	To explore the reasons behind the lower dietary quality among refugee families after their resettlement in the USA.	Qualitative (using focus groups)	(*n*= 127) **75% refugee parents and adolescent** from (Somali, Mexican, Cambodian, Sudanese)	Personal, Environmental, Structural factors	• Data is reported separately by ethnicity **The factors that have an influence on eating patterns were:** • Unfamiliar taste • Accessibility to Junk Food • Lack of time to prepare healthy meals. • Finances

Authors	Country	Objective	Study design	Participants and Ethnicity	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
Wieland et al. (2015)(Wiel and et al., 2015b)	**USA**	To explore reasons for low levels of physical activity among refugees and immigrants.	Qualitative (using focus groups)	(*n*= 127) participant from immigrant and refugee background where refugee represent **75% of the total sample.** They are from (Somali, Mexican, Cambodian, Sudanese)	Environmental factors	• Data is reported separately by ethnicity • One of the most significant barriers to be physically active person was lack of comfort and familiarity to take the first step. • Other factors like, limited finances and language barriers have a significant influence on levels physical activity.
Wilson & Renzaho (2015)(Wilson & Renzaho, 2015)	**Australia**	To investigate the differences in acculturation experiences between parent and adolescent refugees from the Horn of Africa in Melbourne, Australia	Qualitative (using semi-structured interviews and focus groups)	(*n*=40) Horn of Africa refugees	Acculturation	• Data is not reported separately by ethnicity • There was a clear difference between parents and their children in lifestyle, eating habits and physical activity levels. • Parent's feeding practice involved focusing and controlling children's

Authors	Country	Objective	Study design	Participants and Ethnicity	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
		and to explore food beliefs and perceived health risks from an intergenerational Perspective.				dietary behaviours in an attempt to keep their traditional dietary behaviours. • A clear effect of acculturation on diet and physical activity levels.
Wilson, Renzaho, McCabe & Swinbur (2010)(Wilson et al., 2010a)	**Australia**	To explore African immigrant and refugees understanding of Australian food system and how this impact their attitudes and beliefs about food in Australia.	Qualitative (Using semi-structured interviews and focus groups).	(*n*=15) adolescents and 25 parents refugees from the Horn of Africa	Acculturation	• Data is not reported separately by ethnicity • **significant intergenerational differences:** • The complexity of nutrition messages due to poor literacy levels. • Contradiction in body size between Africa culture and Australia culture, which considered one of the main themes.

Authors	Country	Objective	Study design	Participants and Ethnicity	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
						• An abundance of cheap and readily available processed and packaged foods. • Australian food perceived as being full of harmful chemicals.
Renzaho, Green, Mellor & Swinburn (2011)(Renzaho et al., 2011)	**Australia**	To explore parenting styles among African migrants after their resettlement in Australia, and investigate the intergenerational issues related to parenting in a new culture and the possible impact on family functioning and	Qualitative (using focus groups)	(*n*= 85) refugee and immigrants young adults and parents from sub-Saharan African (include Sudanese, Somali and Ethiopians)	Parenting and family functioning	• Data is not reported separately by ethnicity • The results shows that Parenting style in new culture tend to be more authoritarian. • Parents tend to control their children's social development and behaviours through strict boundaries and close monitoring of interest, activities and friends. • Parents reported fundamental difference in lifestyle between Africa and

Authors	**Country**	**Objective**	**Study design**	**Participants and Ethnicity**	**Factors in Research Question**	**Main results (Whether Outcomes presented by ethnicity?)**
		the modification of lifestyles.				Australia relating to allowing their children to play outdoors. They restricting children's engagement in physical activities as result to insecurity neighbourhood

Table 4.6. Overview of the mixed method studies

Authors	Country	Objective	Study design	Participants and Ethnicity	Instrument(S) used	Factors in Research Question	Main results (Whether Outcomes presented by ethnicity?)
Patil, Hadley & Nahayo (2009)(Patil et al., 2009a)	**USA**	To explore the possible mechanisms that help to explain how the diets of newly arrived refugees and Immigrants change after their resettlement in the USA.	Mixed-methods (using face-to-face interviews and survey	Refugees parents of at least one child under the age of 10 from Somalia	The East Coast survey(Hadley & Sellen, 2006)	Acculturation and food insecurity	• Data is reported separately by ethnicity • Participants reported several factors that influence their food choices: 1- Change in the food environment. 2- Economics and time availability constrain the dietary choices. 3- The role that children play in structuring and creating family diet.

Keita et al. (2016)(Keita et al., 2016)	**USA**	To explore the perceptions that Southeast Asian refugee parents' and grandparents' hold of the risk and protective factors for childhood obesity	Mixed methods (using concept mapping)	(*n*= 59) Southeast Asian refugee parents and grandparents.	• The Southeast Asian acculturation scale. (Anderson et al., 1993)	Acculturation	• Data is reported separately by ethnicity • Refugee parents' and grandparents' identify several risk factors and they rated them from most important to the least important: 1- "Healthy Food Changes Made within the School" 2- "Parent- related Physical Activity Factors" Were from the most important 1- "Neighbourhood Built Features" Was from the least important.

Peterman, Silka, Bermudez, Wilde, Rogers (2011)(Peterman et al., 2011)	**USA**	Investigates how acculturation, education, exposure to nutrition information/education, and family composition are associated with specific dietary practices linked to health outcomes.	Mixed methods (using (focus groups and survey)	Two focus groups (*n*=11) and a survey (*n*=150) of Cambodian refugee women. 59% of them had a child younger than 18 years.	• Psychological Acculturation Scale(Tropp et al., 1999). • Dietary Assessment	• Education • Acculturation • Nutrition education Having a child	• Data is reported separately by ethnicity • Higher acculturation level, Higher education and Nutrition education were associated with higher likelihood of eating healthy food items like: • Brown rice/whole grains. • vegetables and fruits • Having a child at home was related to a higher likelihood of eating fast food.

4.5 Methodological quality

Almost all the studies were of moderate to high quality, with only one study rated as low (Tiedje et al., 2014). Two of the quantitative studies received a high score (83.33%) and eight received a satisfactory score (34-66%) (See Table 4.7). The main quality issue was around the approaches to sampling. This has been considered a common methodological issue amongst research into refugee populations (Sulaiman-Hill & Thompson, 2011). Probability sampling was only used to recruit participants in one study (Peterman et al., 2011), with the remainder utilising non-probability sampling. This might be an issue as the sample may not be representative of the whole population therefore views maybe missed or not explored (e.g., from participants who do not volunteer as they are not confident or not able to articulate their experience clearly). It was notable that the majority of studies explored the associations between the different factors and health behaviours.

Qualitative studies were ranked as higher quality compared to the quantitative studies; studies which employed participatory methods (a recommended approach in researching vulnerable populations) were the highest quality. Almost all of the qualitative studies provided information on the underpinning theoretical framework, the appropriateness of the research design; data analysis and findings (see Table 4.8). However, few studies provided information on the impact of the investigator, believability, and evaluation/outcome.

During the cultural quality appraisal, it became clear that the studies were low on some aspects. Although most of the qualitative studies used professional bilingual interpreters, interviewers and meditators to conduct the interviews and focus groups,, only seven of the studies reported comprehensive training (e.g., on cultural and ethical issues, safety considerations, and interview techniques) for the interviewers and interpreters (Morrison et al., 2017; Peterman et al., 2011; Renzaho et al., 2011; Rondinelli et al., 2011; Tiedje et al., 2014; Wilson & Renzaho, 2015; Wilson et al., 2010a). Half of the studies did not mention or report in detail the translation process of the questionnaires, measurement tools, or interviews. Only one study used ethnic matching (i.e., the interviewers were from the same background as the study population) (Vue et al., 2011).

Higher cultural quality was more evident for other aspects: for example the majority offered interviews and questionnaires in both English and the native language of the target population. Providing participants with an option to speak in their own language empowers them to express

themselves more accurately and easily, giving a clearer picture of their challenges. This suggests a high level of cultural sensitivity especially in the qualitative studies. All the studies cooperated with community agencies working with refugees. Together the findings suggest an improvement in the consideration of cultural quality to that seen in other relatively conducted recently meta-analyses (e.g. Nazir, 2015). A more detailed discussion of cultural quality of the included studies is provided in Appendix A .

Table 4.7: Quality Appraisal for Quantitative Research

Author(s)	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Total**
Renzaho & Burns, (2006) (Renzaho et al., 2006b)	0	1	0	1	1	1	Good 67%
Renzaho, Swinburn, & Burns, (2008) (Renzaho et al., 2008b)	0	0	1	0	1	1	Satisfactory 50 %
Peterman, Silka, Bermudez, Wilde, Rogers, (2011)(Peterman et al., 2011)	1	1	1	0	1	1	Good 83.33%
Mellor, Renzaho, Swinburn, Green&	0	1	1	1	1	1	Good 83.33%

Richardson, (2012)(Mellor et al., 2012)							
Dharod, Croom, Sady, (2013)(Dharod et al., 2013)	0	0	1	1	1	1	Good 67 %
Griffith, Mellor, Green & Renzaho, (2014)(Griffith et al., 2014)	0	0	1	0	1	1	Satisfactory 50 %
Anderson, Hadzibegovic, Moseley, Sellen, (2014)(Anderson et al., 2014)	0	0	1	1	1	1	Good 67%
Gichunge, Somerset& Harris, (2016)(Gichunge et al., 2016)	0	0	1	1	1	1	Good 67 %
Cyril, Halliday, Green& Renzaho,	0	0	1	1	1	1	Good 67 %

(2016)(Cyril et al., 2016)							
Morrison et al., (2017)(Morrison et al., 2017)	0	0	1	1	1	1	Good 67 %
Total meeting criteria	1	3	9	7	10	10	

Table 4.8: Quality Appraisal for Qualitative Research

Authors	**Q1**	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**Q9**	**Q10**	**Quality of studies**
Rondinelli et. al, (2011)(Rondinelli et al., 2011)	Unclear	Yes	Yes	Yes	Yes	No	Unclear	Unclear	Yes	Yes	High Quality
Vue, Wolff, Goto (2011)(Vue et al., 2011)	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	No	High Quality
Renzaho, McCabe &	Yes	Yes	Yes	Yes	Yes	No	Unclear	Unclear	Yes	Yes	High Quality

Swinburn (2012)(Renzaho et al., 2012a)											
Tiedje et al. (2014)(Tiedje et al., 2014)	Yes	Yes	Yes	Yes	Yes	No	Unclear	No	No	No	Poor Quality
Wieland et al. (2015)(Wieland et al., 2015b)	Yes	Yes	Yes	Yes	Unclear	No	Unclear	Unclear	Yes	Yes	High Quality
Wilson & Renzaho (2015)(Wilson & Renzaho, 2015)	Unclear	Yes	Yes	Yes	Yes	No	Unclear	Unclear	Yes	Yes	High Quality
Wilson, Renzaho, McCabe & Swinbur (2010)(Wilson et al., 2010a)	Yes	Yes	Yes	Yes	Yes	No	Unclear	Unclear	Yes	Unclear	High Quality
Renzaho, Green, Mellor& Swinburn (2011)(Renzaho et al., 2011)	Yes	Yes	Yes	Yes	Yes	No	Unclear	Unclear	Yes	Yes	High Quality
Total meeting criteria	6	8	8	8	7	1	0	1	7	5	

4.6 Synthesis of findings

The data synthesis process attempted to interpret the retrieved material within two parallel frameworks, namely the refugees' ethnicity and specific history of stress. Five major themes were identified to represent the factors influencing changes in health behaviours related to obesity among refugee children. Since the literature on refugee families is primarily focused on three distinct ethnic groups, the identified factors will be presented by ethnicity (see Figure 4.2): 1) Acculturation, 2) Socioeconomic, 3) Environmental, 4) Cognitive, and 5) Family. Quotations corresponding to the themes are shown in Table 4.9.

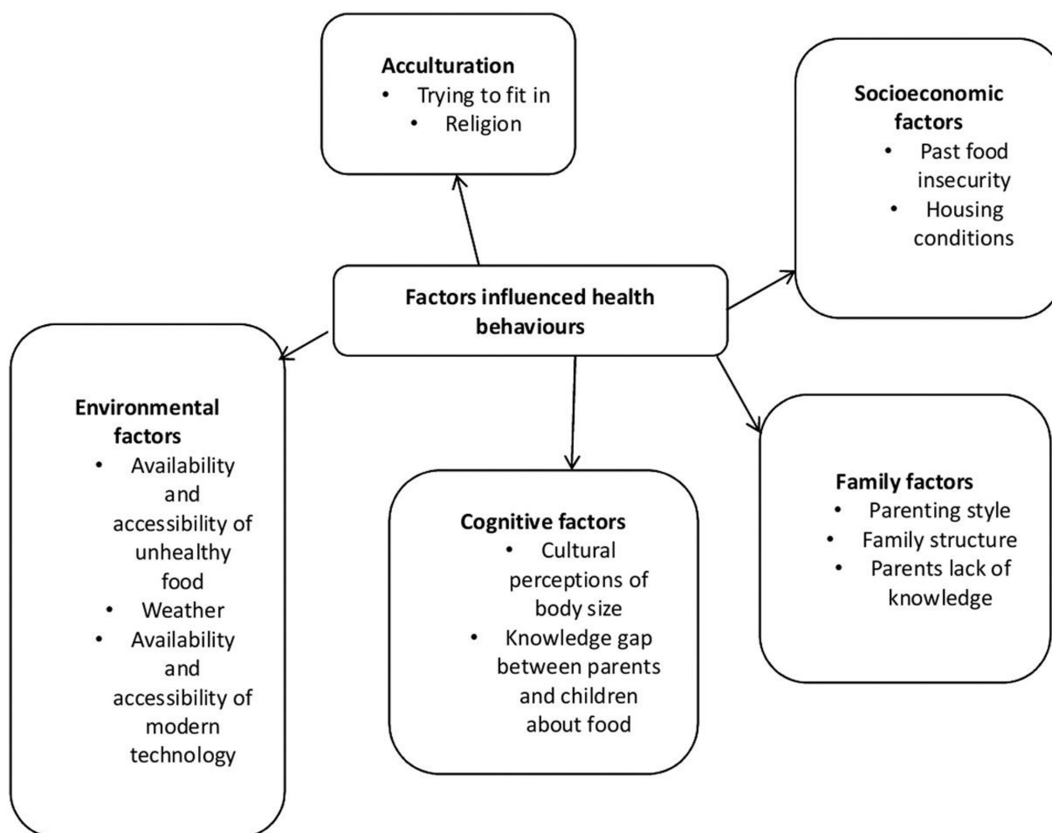


Figure 4.2: Themes illustrating factors influencing changes in health behaviours related to obesity among refugee children.

4.6.1 Acculturation:

Acculturation (i.e., the cultural and psychological changes that occur as a result of two different cultures coming into contact with each other (Berry, 1997) was the focus of nine studies (Patil et al., 2009a; Renzaho et al., 2012a; Renzaho et al., 2011; Rondinelli et al., 2011;

Vue et al., 2011; Wilson & Renzaho, 2015). Under this theme two subthemes were identified: *Religion* and *Trying to fit in*.

Parents across all ethnicities emphasised the powerful impact of acculturation on the diet and physical activity of their children. Dietary acculturation and lifestyle changes were particularly influential due to the promotion of an unhealthy diet and sedentary lifestyle by the hosting culture. Acculturation was shown to affect refugees and different ethnicities in ways that are dissimilar to the impact on other immigrant groups. For example, one author explained how Hmong refugee mothers have a particularly strong desire to maintain family commensality of traditional meals, which reflects also their need to demonstrate, maintain and affirm their own identity (Wilson & Renzaho, 2015).

Acculturation is a crucially important factor that was highly related to the level of acculturation in general. Parents from all the ethnicities studied (i.e., Southeast Asian, sub-Saharan African and Middle Eastern) described the influence of acculturation on their children's diet as having both negative and positive impacts. However, the negative effects on diet and food choices were far more pronounced, with parents reporting that their children's food preference changed markedly with integration into the host culture. In three qualitative studies parents acknowledged a different level of acculturation between themselves and their children, with the children being better integrated into the new culture, explaining their preference for western food and fast food (Renzaho et al., 2012b; Rondinelli et al., 2011; Wilson & Renzaho, 2015).

Regarding traditional food, sub-Saharan African refugee parents placed particular emphasis on the impact of the intergenerational acculturation gap between them and their children. This contributed to changes in their children's dietary intake such as their refusal to eat food that was "spicy" and "hot", instead expressing preferences for mild food. In this way, behaviour demonstrated by the children of refugee parents, like skipping meals or refusing traditional foods, may be attributed to their upbringing and high level of integration into the host culture(Wilson & Renzaho, 2015). The perspective of some adolescents echoed their parents, declaring that they had "developed a taste" for unhealthy food as a result of growing up in western culture (Tiedje et al., 2014). However, the relationship between acculturation and health behaviour was not always negative: for example, one quantitative study found that while the levels of acculturation were generally low among Cambodian refugee mothers, more acculturated mothers reported consuming more healthy food choices (Peterman et al., 2011).

The impact of ethnicity was also influenced by the stressful life experiences of refugees, such as the stressful journey to the host country, the challenges inherent to navigating a new culture/society, stresses relating to financial and legal circumstances, and encountering racism and discrimination.

The combination of having a history of stress (from war/armed conflict, and living in refugee camps), the challenges of living in a new culture or society, financial and legal stresses, and racism and discrimination had clear effects on how refugee children interacted with the food environment. One study, of refugee adolescents, explored the association between health behaviours and negative mood from stress attributed to the refugee experience (Morrison et al., 2017). A significant association was found between negative mood and health behaviours, with those reporting more positive moods also showing healthier behaviours (i.e., reduced consumption of sugary carbonated drinks and higher levels of physical activity).

The above findings suggest that these factors are important for consideration in the development of interventions. This highlights the multidimensional and complex effect of acculturation and ethnicity on the health behaviour of refugees.

The dominant language used in the household and the length of stay in the host country were commonly used as proxy indicators to measure acculturation (Dharod et al., 2013; Fitzgerald, 2004; Hadley & Sellen, 2006; Hadley et al., 2007). Many sub-Saharan African refugee parents reported that language acted as a barrier to the purchase of healthy food (i.e., the inability to read labels in English) and it also shaped their food shopping patterns, by limiting the foods they recognised or knew how to cook without reading instructions. This subsequently affected their children's diet (Gichunge et al., 2016). An additional study found that children of sub-Saharan African refugee parents with low English competency reported a greater intake of 'soda' and 'snacks' as these were pre-prepared and obviated the need to read instructions (Patil et al., 2009a). These children also had a lower intake of fruit and vegetables. This indicated that the children were driving their own diet (Renzaho et al., 2012a).

4.6.1.1 Religion:

Religion was found to be a major part of the lives, identity and culture of refugees, and highly related to health behaviours. Those with a high degree of religious loyalty were more likely to be refugees who had been forced to leave their home country due to a well-founded fear of religious persecution. Forcible migration to a culture with different religious belief was a factor

influencing the adoption of unhealthy eating patterns and lower levels of physical activity. For example, the food choices of sub-Saharan African refugees who followed Islam were more likely to be affected because of their religion, such as the prohibition of non-halal meat and the rules of eating as prescribed by the Qur'an (e.g. appropriate food during Ramadan, fasting). The significance of religion and its close relationship with eating could have a substantial impact on refugee children. For instance, a qualitative study cited an example of young sub-Saharan African girl who skipped lunch at school because 'halal' options were not available on all days of the week (Wilson & Renzaho, 2015). The authors noted that upholding religious values was extremely important to Muslim refugee participants, even when this limited food choices. This could reflect a form of maintaining cultural identity, as identity was connected to food choices (Wilson & Renzaho, 2015).

Religion not only restricts food choices, but it also affected the physical activity of refugee children (Wieland et al., 2016b). Some religions hold strict rules for men and women that can directly impact on the ease of participating in physical activities. For example, in the case of refugee families who follow Islam, there are specific and sensitive rules for acceptable behaviour, especially for young girls to dress modestly. In a qualitative study, mothers reported that the need for modest attire prevented them from accessing sport facilities (Wieland et al., 2015b). The difficulties accessing gyms especially for young refugee girls who wear *Abaya* (loose fitting clothes) was exacerbated as this type of clothing was considered a risk of injury by the gym staff.

4.6.1.2 Trying to fit in:

The qualitative studies revealed that adolescents' food choices often changed in their attempts to gain acceptance from their peers. This was found to be a clear factor affecting sub-Saharan African refugees in Australia, with one study finding that many adolescent refugees perceived eating traditional or ethnic food as "not cool" or "embarrassing" (Renzaho et al., 2012a). Adolescent refugees reported that they had been encouraged by their non-refugee peers to try fast food for the first time, reflect a perceived pressure to adopt unhealthy behaviours in order to 'fit in'. Whilst there was added pressure of fitting in for refugees; one participant explained how the combination of being at an age when fitting in is important and the added pressure of being a refugee made him uncomfortable bringing traditional food to school (Renzaho et al.,

2012a). This rejection of traditional food could also result from ‘rebelling’ behaviours, which are common during adolescence.

Adolescents’ attempts to fit in, in their new society, clearly contrasted with their parents’ attempts to maintain their cultural norms and identity. In adolescents, this reflected a level of voluntary assimilation to the host culture, which refers to the level of acculturation at which the individual rejects their original culture and fully adapts to the way of life of the hosting culture (Wilson & Renzaho, 2015). It was clear that age was a significant influencing factor in the adoption of health behaviours, with adolescents more likely to be influenced by the new culture than younger children. Many parents reported losing control over their children’s dietary intake when they reached adolescence. For example, one mother explained how her older children gained freedom to eat what they want(Wilson & Renzaho, 2015). This strongly relates to the level of acculturation and the attempts by adolescents’ to fit in with the new society.

4.6.2 Socioeconomic factors:

This factor was specifically pertinent to the experience of being a refugee compared to other immigrants, since newly arrived refugee families typically suffer from limited to poor financial situations – this was irrespective of ethnicity. Having been forced to leave their home country, usually from low income, developing countries to high income, developed countries, many families are unable to prepare financially for this dramatic change (Patil et al., 2009a). Factors related to socioeconomic status included 1) housing conditions and 2) past food insecurity and were reported across all ethnicities.

Low income was a key factor in restricting refugee food choices and levels of physical activity. A qualitative study found that limited finances were a barrier for both parents and adolescents to eating healthily(Tiedje et al., 2014) and concluded that socioeconomic challenges faced by refugees after resettlement were significant factors in the negative change to their dietary patterns (Tiedje et al., 2014). A second qualitative study supported this view, revealing how limited finances was an obstacle to accessing sport facilities and subsequently affected physical activity levels among adolescent refugees (Wieland et al., 2015b).

The high cost of healthy food was also an element that shaped diet(Wieland et al., 2015b). For example, adolescents revealed that their parents cannot afford to buy healthy food; this was

especially profound at the end of the month, when food assistance (e.g. 'food stamps') was not available. Many parents reported this limitation as the main reason for their unhealthy food choices (Patil et al., 2009a). This issue was also discussed by Rondinelli et al. (2011), who found that low socioeconomic status led to increased consumption of ready prepared meals and fast food (Rondinelli et al., 2011). Limited economic resources not only led to poor food choices, but also encouraged the development of unhealthy eating patterns. For example, one mother described how she had to cook one type of food and feed it to her children over many days and encouraged her children to drink additional water as a strategy to overcome hunger (Patil et al., 2009a).

Given the above discussion, and in conjunction with the availability and affordability of energy-dense, nutrient-poor foods in western countries, many refugee children experience negative changes to their diet and eating habits. This indicates that economic constraints affect refugee's dietary intake, preventing parents from buying preferred or traditional food when these are expensive (Patil et al., 2009a). The combination of availability and affordability was shown to have a profound impact on food choices among refugee families. Parents complained about the availability of unhealthy food, but when this food was more affordable than healthy items, the parents chose this food. Many parents reported that fast food was cheap to buy and quick to prepare, encouraging busy parents with limited economic status to take these options for their children (Wilson & Renzaho, 2015; Wilson et al., 2010a). In their focus groups, Tiedje et al., (2014) found that many refugee families reported that eating cheap fast food helped them to stay within a tight budget (Tiedje et al., 2014). Furthermore, some studies linked fast food to social status, in which some parents held the perception that takeaway food is only for rich people, perhaps because they could not afford it in their home countries.

4.6.2.1 Housing conditions:

Rondinelli et al. (2011) found that many newly arrived refugee families with limited finances are drawn to poor neighbourhoods, where the rent is low and they can be near other people from the same background to help with resettlement(Rondinelli et al., 2011). Interviews with parents and health providers working with referees revealed how the limited housing conditions were related to increased sedentary behaviour in children and inhibited refugee parents' ability to prepare and safely store healthy food (Rondinelli et al., 2011).

Parents expressed concerns about the safety of their neighbourhoods. This inhibited young people from being active as parents tended to keep their children safe at home. The unintended consequence was increased sedentariness (Rondinelli et al., 2011). This was a common complaint raised by parents in two studies highlighting the importance of neighbourhoods in influencing children's physical activity levels (Renzaho et al., 2012b; Rondinelli et al., 2011).

4.6.2.2 Past food insecurity:

Increased food consumption after resettlement was strongly associated with refugees' experiences of food shortages in the pre-resettlement period (Anderson et al., 2014; Dharod et al., 2013). Prior food insecurity was commonly reported by parents as the reason for their children overindulging once food became available after resettlement. In one study Dharod et al. (2013) found that previous food insecurity among refugee families strongly negatively shaped subsequent dietary intake in the host country (Dharod et al., 2013). Children had an increased consumption of the plentiful high density food (e.g., meat, eggs) and a lower consumption of the less accessible fruit and vegetables(Dharod et al., 2013). They also found a significant and positive association between previous food insecurity in refugee families and increased Body Mass Index (BMI) (odds ratio: 2.66; confidence interval: 1.25-5.69)(Dharod et al., 2013). This was also supported by Anderson et al. (2014), who found that refugee parents who suffered from severe prior food insecurity reported low consumption of vegetables, milk and starchy cereals, such as rice and pasta (Anderson et al., 2014).

According to an early study by Renzaho & Burns (2006), 80% of refugee parents had experienced prior severe food insecurity in refugee camps, as measured by having run out of food for an average of five days, in their home country, refugee camp, or during flooding or drought. This resulted in increased consumption of takeaway food after their arrival in the host country(Patil et al., 2009a; Rondinelli et al., 2011; Vue et al., 2011). Parents explained that when food becomes available, they do not need to worry about what their children will eat the next day, leading them to allowing their children to eat as much as they want, far exceeding previous levels. This reflects the powerful impact of past experience in shaping refugee children's eating habits and food choices post-resettlement.

4.6.3 Environmental factors:

Parents and children differed in the degree to which they felt environmental factors influenced and impacted upon the diet and physical activity of their children. This complex interaction may be related to the diversity of lifestyles experienced by refugees in their countries of reception. The majority of the studies involved refugee parents in the USA, who generally agreed that the environmental factors had a negative influence on their children's diet and levels of physical activity (Patil et al., 2009a; Rondinelli et al., 2011; Tiedje et al., 2014; Vue et al., 2011). Similarly, refugee parents living in Australia agreed that the environmental factors had a negative influence on their children's diet and levels of physical activity. These factors acted as barriers to being active in the new environment, as well as to the consumption of healthy food. These factors were 1) availability and accessibility of unhealthy food, 2) housing conditions, 3) weather, and 4) availability and accessibility of modern technology.

4.6.3.1 Accessibility of unhealthy food

Across almost all studies, the availability of fast food, canned food, processed and pre-prepared food, was perceived as a factor that influenced an increase in unhealthy dietary intake after resettlement. Parents in several studies reported significant differences in food availability between their home country and the USA, with availability in their originating country being highly dependent on location and season (Patil et al., 2009a; Rondinelli et al., 2011). However, in the developed countries, like Australia and the USA, there is often year-round availability of food items imported from different places. This change in the availability of food items had a significant impact on refugees' shopping practices and, eventually, on their diet in general. In addition, children in some studies stated that living in developed countries gave them access to new food choices. One example reported by Wilson et al. (2010) was a sub-Saharan African mother who described her children in the supermarkets, who would say, *"ooh I never had this in Africa…give me some*" (Wilson et al., 2010a).

In conjunction with the history of food shortage that refugees experienced, moving to an environment that provides diverse and affordable food choices, resulted in young refugees eating more and developing the unhealthy behaviour of overindulgence.

4.6.3.2 Weather:

Differences in the weather were commonly reported as hindering refugee children's physical activity in the host country, particularly among refugees living in colder areas of the USA. Relatively cold weather throughout the year was a significant change for refugee families moving from warmer parts of the world, such as countries in Africa and the Middle East, to cooler parts of the world, such as some states in the USA (Patil et al., 2009a; Wieland et al., 2015b). Parents compared their children's level of physical activity in their home country to that of their host country and they perceived weather as one of the environmental factors that adversely affected their physical activity(Wieland et al., 2015b). They stated that since their children were not used to the cold weather, they spent most of their time inside the house engaged in sedentary activities(Wilson & Renzaho, 2015).

Weather patterns were also an important environmental factor in explaining changes to the refugee diet after resettlement in the USA. These individuals showed reported higher levels of stress due to high heating bills during the winter months, which resulted in more limited, poorer nutritional choices for their families (Patil et al., 2009a).

4.6.3.3 Availability and accessibility of modern technology:

In light of the previous factors, such as housing, local safety and weather, it was unsurprising that children became more sedentary and spent most of their time in the house. With the availability of electronics devices, such as mobile phones, video games, computers and TV, many of which were less or not available in their home country, children substituted these for outdoor activities. This was particularly pronounced with refugee children as they (a) did not have access to these devices in their home country, and (b) were more likely to isolate themselves due to the pressures of being in a different country therefore spending most of their time on modern technology(Wieland et al., 2015b). Many adolescents reported that they spent more time watching TV, on social media and playing video games than playing outdoors(Keita et al., 2016; Wieland et al., 2015b). Many refugee children also ate whilst watching the TV and some adolescents reported that this was encouraged by their parents(Tiedje et al., 2014).

Another example was the effect of household technology that was not available in refugees' home countries such as washing machines, vacuum cleaners and dishwashers. Young African refugee girls moving to Australia, perceived that these technologies constituted a dramatic

lifestyle change, as access to such appliances significantly reduced the extensive physical effort previously required to clean their homes (Wilson & Renzaho, 2015).

Alongside the availability of electronic entertainment devices and household goods, modern transportation had the potential to exert a negative impact on shaping food choices and levels of physical activity. One qualitative study revealed life in Australia was physically easier with readily available modern public transport than in the refugee's home country, where they needed to walk everywhere (Wilson & Renzaho, 2015). The availability of cars was perceived by adolescent refugees to be one of the factors that negatively impacted on their level of physical activity post-resettlement as parents now escorted them by car rather than them walking(Wilson & Renzaho, 2015). Parents also reported a greater reliance on cars and a corresponding reduction in exercise over their previous levels in their home country(Wilson & Renzaho, 2015). This contrasted with the high levels of daily physical activity undertaken by refugees and immigrants from the Horn of Africa who were active for economic reasons like "farming and harvesting" or because walking was the only source of transport (Renzaho et al., 2012a).

4.6.4 Cognitive factors:

Cognitive factors have been commonly reported as major factors influencing eating patterns and physical activity among refugees from sub-Saharan Africa(Renzaho et al., 2012b; Wilson & Renzaho, 2015). Perceptions of what is considered healthy or unhealthy food profoundly influenced the dietary intake of refugee children. These types of beliefs were: 1) cultural perceptions of body size, and 2) knowledge gap regarding food between parents and children.

4.6.4.1 Cultural perceptions of body size:

Almost all of the qualitative studies concentrated on refugee families from Africa. Many of the refugee parents from this region held a cultural preference for large body sizes, which represents wealth and beauty in their culture (Renzaho et al., 2012a). Unsurprisingly therefore, parents tended to maintain these cultural beliefs and to promote weight gain among their children (Renzaho et al., 2012a).

Cultural preferences for larger body size was not only seen among parents from sub-Saharan African cultures, but also amongst refugee parents from Southeast Asian cultures (e.g. Hmong). As a consequence, parents with this perception encouraged their children to gain weight by

using unhealthy feeding practices, such as encouraging them to eat more (Renzaho et al., 2012b; Wilson & Renzaho, 2015) or feeding lots of milk and cheese to young children (Renzaho et al., 2012a). It might be that parents, in seeking to reinforce their traditional beliefs, are inadvertently also encouraging the development of negative eating habits among their children; for example, parents reportedly offered their children fast food and even restricted their physical activity, potentially incentivising weight gain (Renzaho et al., 2012b). Some adolescent refugees held similar views to their parents, reporting that their culture viewed a large body size as "highly valued" and signified "wealth" and "success", with slimness perceived as a sign of sickness and poverty (Wilson et al., 2010a).

Parental perceptions of large body size not only influenced dietary intake, but also physical activity levels. In one study, parents, particularly fathers, were reported to restrict involvement in sport activities to promote large body size. Fathers perceived the involvement of their children in school sport activities as a "waste of time and pointless", which necessarily influenced physical activity levels. Renzaho et al. (2012) found that these cultural perceptions were held by the majority of parents, with only a small number of mothers linking large body size to negative health consequences (Renzaho et al., 2012b). Typically, these women were single and more highly educated, reflecting the importance of knowledge and education about food.

4.6.4.2 Knowledge gap between parents and children about food:

Parents and their children demonstrated a clear gap in knowledge of food, and this was particularly clear among sub-Saharan African refugee families. In the included studies, refugee parents and children often had different views regarding what should be considered healthy food. This might be strongly associated with the cultural influences of what food is regarded as healthy. For example, one study found that parents failed to link fat to negative health consequences (Renzaho et al., 2012a), refugee parents were uncertain about what should be considered healthy and explained that they had never previously worried about food labels or levels of fat (Patil et al., 2009a). This uncertainty may be linked to language difficulties, with many refugee parents expressing difficulties with reading and understanding food labels. For some this resulted in children taking charge of food choices. Furthermore, there was a conflict between parents and children as many parents believed that traditional food or ethnic food was

healthy; however adolescents reported that their traditional food is unhealthy and full of fat (Tiedje et al., 2014).

Regarding acculturation, refugee children were generally more integrated into the host culture than their parents, with correspondingly greater exposure to knowledge about food. Therefore, refugee children in particular sub-Saharan African and Southeast Asian were found to possess superior knowledge of food and nutrition than their parents in four out of eight qualitative studies (Renzaho et al., 2012a; Tiedje et al., 2014; Wilson & Renzaho, 2015). While children in some studies developed a taste for fast food, these children also worried about their parents' feeding practices and restriction of physical activity (Tiedje et al., 2014). They reported greater awareness of healthy food and tended to disagree with their parents about body size preferences (Tiedje et al., 2014). These children were usually considered to be highly integrated into the new culture, as a result of high levels of exposure and education. When asked about their source of knowledge about food, the most common knowledge sources that adolescents reported were school and the media (Vue et al., 2011). While the media can play an important role in educating children about food, it can also negatively affect their eating patterns, with TV advertisements regularly encouraging unhealthy food choices.

4.6.5 Family factors:

The family was identified as the main element that had an impact on the health behaviours of children. Family functioning, structure and parenting style influenced the diet and physical activity of refugee children. A stark difference was found between the perceptions of refugee parents and adolescents regarding their family functioning and communication (Cyril et al., 2016; Mellor et al., 2012). For example, Cyril, and colleague (2016), found that the majority of children perceived their family as functioning more poorly than their parents, and this was strongly positively associated to their BMI (Cyril et al., 2016). The eating behaviours of children were shown to be strongly influenced by family functioning, through parental dietary practices, food choices and family meal environment (Cyril et al., 2016). Parents were found to have greater control over the lifestyles of younger children; however, adolescents in also thought their parents played an influential role in determining their diet and influencing their levels of physical activity (Renzaho et al., 2012b; Tiedje et al., 2014; Wilson & Renzaho, 2015; Wilson et al., 2010a).

4.6.5.1 Parenting style

Parents were identified as one of the primary sources of information for children about eating habits and food knowledge. The majority of the studies showed that parenting played a significant role in the feeding practices and dietary intake of young children (Vue et al., 2011; Wilson & Renzaho, 2015). For example, parents from sub-Saharan African countries tended to be restrictive and to exert a high level of control over their child's eating habits. This was particularly prevalent among newly arrived refugee parents, who were fearful of losing their cultural identity and feared that their children would lose their cultural values, thereby weakening their family attachments (Wilson & Renzaho, 2015). Studies that investigated parenting style found that children perceived their parents to be more authoritative than their parents believed themselves to be, and that parents exerted profound influence over the lifestyle behaviours, and dietary intake, of their children (Cyril et al., 2016).

In contrast, some parents reported difficulties controlling their children's diet in the host country, particularly young mothers who reported the challenge of "saying no" to their children (Vue et al., 2011). Moreover, some parents showed concern about their own diet and explained how they had given up traditional or healthy food to ensure that their children ate well. This strong desire of having control over their young children's diet and physical activity was also linked to parental cultural perceptions of body size, or cultural and religious beliefs.

4.6.5.2 Changes in family structure:

After migration, family dynamics experienced dramatic changes, which created familial conflict. These marked changes in the family structure could be particularly challenging for parents from collectivist societies, such as many African nations, where mothers are responsible for house work and raising and feeding the children, while fathers work outside the house (Wilson & Renzaho, 2015). Many refugee mothers described having to work in the host country as being "stressful" and expressed feelings of "loss identity" (Renzaho et al., 2012a; Wilson & Renzaho, 2015). Given the previous factors, changes in family structure may also be highly related to acculturation and low socioeconomic status. Mothers who have to work long hours do not have enough time to prepare healthy meals: Many adolescents expressed how their mothers were too busy to cook for them. A lack of time to prepare meals was found across all the studies. Given competing priorities, the preparation of healthy food was accorded a

lower significance than going to work, especially for refugee parents who had a low socioeconomic status.

Table 4.9. Thematic framework with illustrative quotations from the studies

Analytical theme/subtheme	**Quotations**
1. Acculturation	
• Acculturation	*"Younger people don't eat Hmong food as much as American food."* (Vue, Wolff & Goto, 2011, p. 201). "*People are very active [in Africa]. Not many people have cars. People move a lot. Walk a lot too. But here [in Australia] we use car for little distance.*" (Wilson & Renzaho, 2015, p.179).
• Religion	"*On Thursday I bring something else, I can't eat it [school canteen food]. It's not halal."* (Wilson & Renzaho, 2015, p.182). "*I used to go there with my abaya (loose fitting clothes). Then the staff there told me that I could not wear the abaya because it was a risk for injury*." (Wieland et al., 2015, p.272).
• Trying to fit in	"*It is embarrassing to take traditional food from home. Too messy! We do not want to stand alone and stand out when everybody is having sandwiches and answering questions like, "What is this, are you having spaghetti?"... Yeah, I get $5 every day, but this is not enough to buy a healthy meal*." (Renzaho, McCabe & Swinburn, 2012, p.746).

2. Socioeconomic factors	
• Socioeconomic factors	*"They get to the US and they're eating fast food. They may not have access to a kitchen, they may not have money to buy groceries ahead of time and they have to sort of eat from their pocket… so fresh, healthy food can be really hard to come by when you're very poor." (*Rondinelli et al., 2011, p.156).
• Past food insecurity	"*You don't have to worry about what you are going to eat like the next day. People eat more than what they usually did back in the day, with food available on a daily basis, individuals can eat as much as they desire."* (Vue, Wolff & Goto, 2011, p.201)
3. Environmental factors	
• Availability and accessibility of unhealthy food	*"There is [a] McDonalds on every corner: When people don't have food at home, they just take the family to McDonalds: It's easier to get junk food than healthy food because you just open a bag or put it in the microwave. [With] healthy food, you have to cut the lettuce, cut the tomatoes*" (Tiedje et al., 2014, p.8).
• Housing conditions	*"Usually the housing… conditions that they live in, you know they just can't go outside and play by themselves… kids are more sedentary now…*" (Rondinelli et al., 2011, p. 165).

	"*The kids, no backyard to run. You see there is no yard. House is small, nowhere to move*.' (Wilson & Renzaho, 2015, p.179).
• Weather	"*The snow. The snow creates a little difficulty and the winter season because naturally his body feels more tired and wants to sleep…*" (Wieland et al., 2015, p.269).
• 2.8. Availability and accessibility of modern technology	*"And technology nowadays like Facebook, phones and stuff... you'll just be sitting down and doing that the whole entire day"* (Wieland et al., 2015, p.269). *"It's hard going on [...] a diet and eating healthy when your brothers and sisters are watching TV and eating junk food, and if you're a family, [you] motivate each other"* (Tiedje et al., 2014, p.10). "*People are very active [in Africa]. Not many people have cars. People move a lot. Walk a lot too. But here [in Australia] we use car for little distance."* (Wilson & Renzaho, 2015, p.179).
4.Cognitive factors	
• Cultural perceptions of body size	*"Big body size means you have plenty to eat. We have a proverb that says, 'Whatever goes through your throat is seen through your body.' If you are thin, it means not much food goes through your throat, you are poor."* (Renzaho et al., 2012, p.748). *"a bigger person is healthier" and "a skinny person is a sick person*". (Tiedje et al., 2014, p.12).

	"our culture... view[s] being big and bulky as a good thing." (Vue, Wolff & Goto, 2011, p. 202).
• Knowledge gap between parents and children about food	*"In Sudan, our food [has] a lot of fat in it. If there is no fat, then it is not right. That's my culture."* (Tiedje et al., 2014, p.8).
5. Family factors:	
• **Parenting style**	*"You can't really tell your parents: 'Your food, I don't like it.' They'll just say: 'Eat!'"*. (Tiedje et al., 2014, p.12). *"It is very hard to say 'no' to a child... so it is good to cook lighter."* (Vue et al., 2011, p.202). *"They do not want their children to feel hungry and that is why they get the children the foods that they prefer*." (Patil et al., 2009, p. 352).
• Changes in family structure	*"My mom doesn't cook anymore because she is always at her job"*. (Tiedje et al., 2014, p.9).

4.7 Discussion

This review is the first to synthesise the literature exploring changes in diet and physical activity levels among refugee families and identify the factors influencing health behaviours and childhood obesity among refugee children. It is particularly important to note that a refugee might experience specific difficulties with host culture and food as a result of their more stressful migration history which is likely to set refugees apart from other migrant children. Utilising both qualitative and quantitative synthesis, this systematic review suggests that a complex interplay of factors influence the development of health behaviours that are detrimental to health among refugee children. The diet and physical activity levels of refugee children have been shown to be powerfully influenced by acculturation, environmental,

socioeconomic, family and cognitive factors. We have interpreted the results within two parallel frameworks: history of stress and ethnicity. There were only two studies that linked the history of stress and living in refugee camps to the changes to refugee's health behaviours after their resettlement in the host country (Patil et al., 2009a; Renzaho & Burns, 2006). This might be because eight of studies combined forced and planned immigrants together as one cohort. This limits meaningful and specific analysis of outcomes in relation to refugee populations. The findings show that the literature focusing on refugee children has a number of limitations. Outcomes such as ethnicity and BMI have not been consistently reported limiting the opportunities to compare outcomes between different ethnic groups. For example, only two of the included studies reported the BMI of participants, both of which studied African refugees relocated to Australia (Cyril et al., 2016; Renzaho et al., 2011). This represents an important limitation of this review since refugees from different ethnic groups and countries of origin are likely to have different between-group experiences. Thus, obesity trajectories can be expected to be diverse in refugee children, being related both to the lifestyle they had in the country of origin, and the lifestyle they encounter in the country of reception. The latter should not be forgotten, since obesity rates differ greatly between high income countries, due to complex and multi-determinants included genetic, behavioural, social, and environmental determinants.

Refugee parents of different ethnicities and their children reported in both qualitative and quantitative studies that different levels of acculturation influenced their diet and physical activity. An expanding body of literature has investigated the relationship between acculturation and obesity, such as a systematic review into the association between acculturation and obesity among immigrants to a high income country (Delavari et al., 2013). This supports assertions in the literature, which describe a negative association between acculturation and health behaviours among African and Hispanic immigrants to the US(Gordon-Larsen et al., 2003; Mills et al., 2017). Furthermore, dietary acculturation represents a greater effect on refugee's health than physical activity. This influencing factor is supported by the literature, which highlights the impact of acculturation on dietary change. For example, a recent systematic review of the relationship between acculturation, dietary intakes and the body weight status of children of immigrants concluded that a wide variation exists in the relationship between acculturation and dietary intake (Zhang et al., 2019). Although this position is supported in our findings, it does not suggest that the positive impact of acculturation was equal to the negative impact.

In our findings, acculturation also included the adoption of a more sedentary lifestyle, which affected levels of physical activity. These results corroborate the findings of a recent study, which concluded that young refugees from Nepal, Somalia and Sudan to the USA had fewer opportunities to be physically active than in their home country. This was largely attributed to their cultural perception of physical activity, with individuals needing to make a conscious effort to exercise in developed countries, rather than physical activity being integrated into their daily lives, as was the case in their home countries (Meng et al., 2018).

The subtheme of religion was shown to exert an impact on health behaviours. Religious beliefs can influence the dietary intake of refugee children and restrict their physical activity, suggesting that holding these beliefs in a completely different environment that does not offer the dietary requirements that meet these religious beliefs can have an impact on health. For example, some studies described how participants felt restricted by Halal food and this affected their eating patterns especially at schools as some of them explained how they skip lunch in school since they do not offer Halal options(Wilson & Renzaho, 2015). This view was supported by Terragni et al. (2014), who found that Muslim refugees restricted their food consumption to those food items perceived to be acceptable by their religion, which meant that their eating habits and diet were affected. These contrasts with previous research that showed how religious beliefs are considered to be a highly important component of cultural identity, with some recent research indicating that religious beliefs can act as a protective factor for young refugees and immigrants, facilitating their ability to overcome challenges and avoid the adoption of unhealthy behaviours, such as alcohol use, during the acculturation process (Bhugra & Becker, 2005; Curtis et al., 2018).

The findings showed that age was a moderating factor. Adolescent refugees tended to voluntarily integrate into the host culture, attempting to fit in through behaviours such as the adoption of culturally more acceptable fast food. In contrast, younger children were highly influenced by their parents. The wider literature supports this finding, showing that acculturation at a young age to high income country like the USA is significantly associated with increased consumption of fast food among adolescent immigrants (Unger et al., 2004). This may explain the extent to which age-associated differences can affect the impact of acculturation.

One of the main factors affecting refugee children is their environment, which includes changes in weather, living in poor housing conditions, access to modern technology, and living in a new

food environment with higher availability of unhealthy, convenient food. These environmental changes have a noticeable effect on the eating habits and levels of physical activity among refugee children. These findings are consistent with existing research, which has overwhelming negatively associated environmental factors with dietary habits and levels of physical activity among immigrants to high income countries (Caperchione et al., 2009; Lindsay et al., 2009; Rothe et al., 2010).

The present study identified that socioeconomic factors had a powerful effect on dietary intake. An interesting finding was the negative association between past food insecurity and the current eating habits of refugee children, as manifested in overeating and consumption of nutritionally dense foods. This change in eating habits was explained as a response to exposure to a food-rich host environment after having lived through food shortages. This matches the outcomes of previous studies, which identified that refugees with experience of food deprivation may adopt unhealthy eating practices, including increased consumption of high-density food (Peterman et al., 2011; Wang et al., 2016). Food insecurity is prevalent among refugee families after their resettlement in the host country (Anderson et al., 2014; Dharod et al., 2013). The experience of economic hardship and lack of social support distinguishes many refugees from other immigrants, making them more vulnerable and at higher risk of developing unhealthy behaviours as a result of enduring these situations.

Refugee parents from sub-Saharan African backgrounds have a cultural perception of preferred body size; specifically, a preference for a larger body shape, that may encourage behaviours that can lead to obesity. Our findings showed that the strong desire of these individuals to maintain their traditional orientation is a determinant that influences the diet and levels of physical activity of their children. This is especially true for younger children, who often have little freedom regarding their dietary intake in comparison to adolescent refugees. Parental fear of losing their cultural identity was shown to be more extreme among refugees than economic immigrants, perhaps because they have been forced to leave their home country. This is different from the experiences of typical immigrants who may have choice and time to prepare. Refugee parents from sub-Saharan African countries may have preference for larger body sizes, as this characteristic represents health and wealth in some African cultures. This cognitive perception can then influence the development of unhealthy feeding practices that may impact their children. This finding has important implications on parental feeding practices and the corresponding weight status of their younger children.

There may be inconsistencies in the health literacy of refugee families, particularly around nutrition (Patil et al., 2009a; Tiedje et al., 2014). This knowledge gap may reflect the parental educational level. These results support the findings of studies outside the immigration literature, which show that maternal education level is associated with children's consumption of fruit and vegetables (Santiago-Torres et al., 2014; van Ansem et al., 2014). These factors demonstrate significant influence of parental knowledge on the eating habits.

Family plays a significant role in influencing the diet and physical activity levels of their children. A number of determinants were identified in this review, including parenting style, family functioning, family communication and family type. Refugee parents reported poor family functioning and lack of discipline, which were associated with childhood obesity (Cyril et al., 2016; Griffith et al., 2014). These findings support the literature, in which higher family functioning is associated with a more healthy BMI and active lifestyle among adolescents (Berge et al., 2013). Discrepancies were also found in terms of perceptions of parenting style (Cyril et al., 2016), with refugee parents perceiving themselves as more authoritative. Further, adolescents reported high levels of parental control over their eating and physical activity levels. This supports the literature, which broadly asserts that the majority of newly arrived refugees utilise an authoritarian parenting style and that this is associated with the BMI of adolescents (Berge et al., 2010; Wilson & Renzaho, 2015).

This review reveals the important role of parental practices in influencing the health behaviours of children, especially younger children, who are under tighter parental control than adolescents and suggests an avenue for intervention and support. Moreover, most of the studies reviewed were conducted in the USA and Australia, with comparatively few in Canada or European countries. In particular, no study has focused on the health outcomes of refugees after settlement in the UK, which represents a gap in the literature, especially given the large numbers of refugee families resettling in the UK every year and differences in lifestyle and healthcare access compared to other countries. Another limitation of the body of literature that this review has revealed is that most of the studies included immigrants in the sample, so results could reflect the experience of immigrants who choose to move to another country, as well as refugees. Refugees and immigrants share many similar challenges and characteristics, however those undertaking forced migration have a unique history of stress and distinct needs and obstacles, not least since their host country may not be their chosen destination and the journey is likely to have been traumatising.

The outcomes of this review suggest a number of recommendations for healthcare professionals, researchers, and policy makers to improve care for refugee children in terms of obesity prevention and treatment. More research on this population is needed to better understand how refugees from different countries with different ethnicities interact with local food options and the culture of the host country. Future research could also undertake a comparative prospective investigation to examine the effect of different ethnic backgrounds, in order to explore the interactions between ethnicity/acculturation and refugee stress. Specifically, a future study could examine BMI trajectories in children of different ethnicities to assess whether differences exist between children from different backgrounds. This is important in light of the marked increase in the number of refugee children arriving in Europe. Given the limitations of the literature, a better understanding of the experience and perspectives of refugee families regarding the health behaviour change and weight management of their young is necessary to develop interventions to tackle childhood obesity.

Chapter 5. A qualitative investigation of the health behaviours of young children from refugee families using Photo Elicitation Interviews

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5.1 Abstract:

Objectives:

To explore the experiences and perspectives of refugee parents regarding health behaviour changes among their children (i.e. changes in diet, levels of physical activity) and the impact of these changes on the health of their children aged 2-12 years.

Design:

A qualitative approach using semi-structured interviews supported by photo-elicitation.

Methods:

Parents of 2 to 12 years old children who had relocated to the UK within the past three or more years were recruited from two refugee organisations in the UK. Semi-structured face-to-face interviews and photo-elicitation were used to stimulate face-to-face in-depth discussions with participants. Data were analysed using an inductive and latent thematic analysis approach.

Results:

Twenty-seven parent refugees were recruited. Participants were primarily mothers (85%) and from Syria (70%). Other countries of origin were Sudan, Eritrea, Iraq, Kuwait, Libya and Tunisia. Twenty-six interviews were conducted in Arabic and one in English. The analysis identified three themes: 1) Reflection on acculturation, 2) Changed parental role, and 3) Environmental barriers to being healthy. Participants described facing substantial changes to their lifestyle and personal context, including a restricted living space, restricted neighbourhood/community and inclement weather. These differences in the environment required parents to adjust their roles, and practices around their own and their child's eating habits. These changes influenced refugee children's health behaviours. Of particular concern to parents were increased sedentary behaviour and consumption of unhealthy snacks.

Conclusions:

Multiple factors were identified relating to changes in family circumstances and environments that influenced refugee children's health behaviours. Targeting these behaviours in tailored interventions may help improve refugee children's health.

Key Words:

Diet, physical activity, refugee, paediatrics, family health, photo-elicitation

5.2 Introduction:

Childhood overweight/obesity is a major public health issues worldwide and is associated with poor health consequences in childhood such as hypertension, insulin resistance, orthopaedic problems, and poor quality of life(WHO, 2021). Childhood obesity also has well-recognised effects on the longer-term wellbeing of individuals, such as obesity in adulthood, cardiovascular disease, diabetes, musculoskeletal disorders and cancers (Freedman et al., 2007; Pinhas-Hamiel & Zeitler, 2007; Taylor, 2006; WHO, 2021). Recent increases in the obesity rate have been particularly pronounced among refugee children settled in developed countries; a recent review reported that obesity rose in refugee children from between 9% - 17% at arrival to between 21% - 35% after settlement in the host country (Kumar et al., 2021). There is therefore a need for intervention to prevent obesity in young child refugees settled in developed countries.

The early environment has been recognised as exerting a powerful, long-lasting effect on a child's health including the development of obesity(Anzman et al., 2010). Most excess weight prior to entering puberty is gained before 5 years of age, illustrating the critical importance of this early period in contributing to childhood obesity (Gardner et al., 2009; Hui et al., 2008; Monteiro & Victora, 2005; Ong & Loos, 2006). As a consequence of this, focusing on early childhood is fundamentally important in addressing health behaviours related to childhood obesity (Anzman et al., 2010; Lanigan et al., 2010). This assertion is supported by the position of the UK health policy, which recognises the importance of early environment interventions in tackling the obesity problem (HealthCommittee, 2004).

To build an intervention it is important to identify the key behaviours that influence obesity – such as food consumption and physical activity (Raj & Kumar, 2010; Smith et al., 2011). Obesity is attributed to a multitude of factors including direct influences on food consumption (e.g., portion size) and physical activity (e.g., level of physical activity) (Vandenbroeck et al., 2007). It is also important to understand other factors that influence these key behaviours such as media (e.g., exposure to food advertising), social (e.g., peer pressure), psychological (e.g., food literacy), economic (e.g., affordability of healthy foods), environmental infrastructure (e.g., walkability of local environment), developmental (e.g., quality/quantity of breast feeding), biological (e.g., metabolism) and medical factors (e.g., level of infections) (Vandenbroeck et al., 2007).

A recent systematic review of studies that reported on factors related to obesity in child refugees following resettlement in developed countries found evidence for many of the above multiple influences on obesity(Alsubhi et al., 2020). Factors directly related to unhealthy food choices included poor food literacy, increased availability of unhealthy foods, and decreased availability of healthy foods (Alsubhi et al., 2020). Factors related to overconsumption of food included temptation from increased food variety and abundance relative to their home countries and reacting to previous food insecurity by overeating whilst food was available (Alsubhi et al., 2020). Factors related directly to activity were lack of opportunity to exercise due to poor weather, reduced domestic activity due to labour saving devices, and lack of value given to sporting activities(Alsubhi et al., 2020).

Regarding factors that influence food consumption and activity there were many influences. Media effects were mentioned such as exposure to advertisements for unhealthy foods and the availability of passive entertainment such as TV, social media and video games (Alsubhi et al., 2020). Social influences included being embarrassed about eating traditional foods when others are eating host country foods, peer pressure to try unhealthy foods, cultural body size preferences affecting food choices and activity levels and being unable to exercise because of a mismatch between religiously recommended loose clothing and gym requirements(Alsubhi et al., 2020). Psychological influences include stress from the refugee experience (from previous trauma and current environment) leading to negative mood and the consumption of unhealthy foods, not knowing how to prepare unfamiliar foods without being able to read instructions due to language barriers and perceived lack of safety to resulting in a lack of opportunity to exercise outside the home(Alsubhi et al., 2020). Economic factors included lack of affordable exercise facilities and healthy food and inexpensive energy dense junk foods. Environmental infrastructure influences included the increased availability of public transport and cars precluding the need to walk (Alsubhi et al., 2020). There was mention of a biological influence in terms of tiredness in Winter affecting ability to be active (Alsubhi et al., 2020). There were no developmental (i.e., quality and quantity of breastfeeding or appropriate conditions that affected maternal, fetal or child growth), or medical (i.e., level of infection, reliance on surgical or pharmacological interventions) influences (Alsubhi et al., 2020).

The systematic review provided a wealth of information on factors related to obesity in refugee children that could be used to inform interventions. However, there were some

limitations of the review as there were few studies that focused on young children in particular, few studies that reported solely about refugees (they often included non-refugee immigrant experiences) and there were no studies that reported the influences on refugee children's food consumption and physical activity in the UK. In an attempt to address these issues, the aim of the current study is to explore the experiences and perspectives of refugee parents regarding their children's health behaviour (i.e. food consumption and physical activity). Specifically, the objectives are to identify the role played by parents in influencing the diet and physical activity of their children, with specific reference to current eating practices and their perspectives regarding factors that might influence their children's levels of physical activity and food consumption after resettlement in the UK. In addition, this study will explore whether these levels could be linked to the changes in their children's weight. These findings will identify the factors that parents perceive to be important in their child's weight changes, thereby informing the design of a culturally appropriate intervention to promote healthy growth (e.g., increased physical activity, following a healthy diet) targeting refugee families with young children. This study aimed to: 1) gather parental perspectives of refugee families regarding the changes in health behaviours from pre-resettlement to post-resettlement; 2) identify the salient factors that influence the pre/post-settlement changes in the health behaviours of parents; and 3) explore the role of parents in influencing their children's health behaviours.

5.3 Methods:

5.3.1 Design

The study used qualitative methods with parents of refugee children comprising semi-structured interviews and participant-driven photo-elicitation in combination with participant, public involvement. Photo-elicitation interview (PEI) is a qualitative technique where the researcher uses photographs or other images as stimuli to elicit responses, reactions, and insights from participants (Collier, 1957; Collier & Collier, 1986; Harper, 2002) – in this study PEI was used to to gain insights into the ways in which refugee parents make sense of their experience and their roles regarding their children's diet and physical activity (Elliot et al., 2017; Hurworth et al., 2005; King et al., 2018). Patient and public involvement (PPI) is where patients or the public are actively involved in the generation of the data (not merely as participants; (Clark-Ibáñez, 2004; Frohmann, 2005; Jansen & Rae Davis, 1998), in this instance

a group of refugee parents provided the images that the interviews revolve around (see the methods section for more detail).

These methods were used as they are particularly useful for use with vulnerable populations such as refugees who have often experienced traumatic events that may cause them to feel emotional or sensitive when reflecting upon the changes in their lifestyle after resettlement (Gifford et al., 2007; Svensson et al., 2009). This method provides (a) forum for the participant to discuss potentially sensitive topics by allowing them to select images that evoke reactions, emotional responses, and meanings that may not have been accessible using verbal methods alone (Harper, 2002; King et al., 2018), (b) a highly effective way of building trust and rapport with participants (Gifford et al., 2007) with shared control of the interview process (Hurworth et al., 2005; Orellana, 1999) to reduce the historical power dynamics between researcher and participants because the participants are capable of defining what is important (Lapenta, 2011), and (c) helps the researcher to access a world that may not be familiar, thereby providing a shared understanding of the participants' experience. The methods also enhances the rigor of qualitative methods through multi-method triangulation(Hurworth et al., 2005; Orellana, 1999).

5.3.2 Data collection

5.3.2.1 Patient and public involvement and engagement

The study materials were developed based upon discussions with members of the targeted population. Three refugee mothers of young children were selected purposely to reflect the targeted population, e.g. members of a group with specific defined characteristics. They provided assistance in evaluating and assessing the participant information sheets and the interviews topic guide in terms of the clarity and accessibility of these documents to the targeted sample population e.g. PIS for readability, photos for relevance, etc (Please see Appendix B for PIS). The discussions with the mothers resulted in a number of changes being made to the participant information sheets, including the addition of further explanations of the study aims and the provision of examples of health behaviours (e.g. healthy diet, being physically active). The refugee mothers also helped in assessing and formulating some of the interview questions (Please see Appendix C for topic guide). This was important as interview questions are essential for eliciting rich responses and are most effective when participants are able to understand the meaning of the questions. They also had been involved in generating the

photos that used in the interviews. This was important to ensure that these pictures were reflecting the daily lives of refugee families after their resettlement in the host country.

5.3.2.2 Interviews

The study materials were developed based on results from the systematic review (Alsubhi et al., 2020) from previously available research, and from discussion with participants from the study population. We used the social cognitive theory (SCT) to develop the interview guide for multiple reasons (Bandura, 2004). This theory recognises the interaction between individual factors (e.g., self-efficacy to eat a healthy diet or being physically active) and social environmental factors (e.g., social support networks) on behaviour change (Wieland et al., 2018). In addition, low self-efficacy is considered as one of the influential barriers to eating a healthy diet and being physically active(Sheeshka et al., 1993; Trost et al., 2002). Furthermore, a supportive family environment has an important, positive influence on health behaviours among immigrant families (Marquez & McAuley, 2006). This theory has been instrumental in forming the conceptual base of previous research targeting refugee families (Morrison et al., 2017; Tiedje et al., 2014; Wieland et al., 2018; Wieland et al., 2015a).

Therefore, the interview topic guide included questions that assessed: 1) participants' understanding of what comprises a healthy diet, descriptions of food and types of physical activity, food environment, and dietary patterns; 2) participants' perceived barriers to eating healthy food and being physically active for their children and as a family; and 3) differences in dietary patterns and levels of physical activity "back home" and in the UK.

5.3.2.3 Photo elicitation

Three mothers agreed to be part of the PPI group; they represented the targeted population and were considered eligible according to the inclusion criteria. The PPI group were involved in generating and selecting the photos that would be used in the interviews and reviewing the topic guide and information sheet. At the PPI meetings, the researcher gave a brief outline of the rationale of this study, and then provided guidance on the type of photos that needed to be generated and the topics and content of the photos. First, examples of photos were selected from free image bank, with the assistance of and discussions with the research team (which involved three experts in health psychology and behaviour change), to help PPI understand what type of photos they should generate, the photos were from free image banks reflecting

refugee life after resettlement (*Refugee Child iStock*, 2019). For example, photos were about meal time, eating behaviours, shopping practices, home environment, and examples of types of physical activity during the week, and the type of snacks their children have. Second, ethical considerations of the content of the photos were taken into account, such as PPI members being asked to share photos where their children could not be identified from the pictures.

The PPI group generated the majority of the photos used in the interviews. The final selection of photos resulted from a two-stage process, with the PPI group generating the photos and then participating in a discussion regarding the final selection of photos that followed all the ethical considerations. The research team made a final decision on the numbers and the photos that would be used in the interviews.

The researcher displayed a photo that related to the topic, using each image as a prompt to initiate further dialogue and to follow up new, emerging ideas, as well as the use of probes. For example, when asking participants about their meal routine, the researcher would present a photo that represented meal time in their Culture, which enhanced the opportunity for participants to share more and for the researcher to further explore their experiences.

5.3.3 Participants

Twenty seven parent refugees took part. Participants were primarily mothers (85%) and from Syria (70%). Other countries of origin were Sudan, Eritrea, Iraq, Kuwait, Libya and Tunisia. The characteristics of participants are illustrated in Table 5.1. It has been suggested that greater heterogeneity and improved representativeness in studying refugees can be achieved by increasing sample sizes, using quotas for key demographic variables (Sulaiman-Hill & Thompson, 2011). Therefore this sample was large to achieve the sufficient information power this sample holds (Mthuli et al., 2021).

Participants were recruited from two different refugee organisations (Rethink Rebuild, Rainbow Haven), which operate in a large northern city in the UK. Potential participants were identified with the assistance of national and local refugee organisations, where posters and leaflets of the study were distributed within the organisations. In addition the professionals working with refugees would provide potential participants with information sheets that describe the study and will obtain permission from those interested in taking part for the

research team to contact with further information; whilst fathers were included in the eligibility criteria, none volunteered.

Eligible participants under the selection criteria were refugee parents (mothers and fathers) of young children (aged 2-12), who have been resettled in the UK for more than three years. We decided to focus on the refugee parents of young children aged 2-12 who have resettled in the UK for more than three years. These criteria were selected due to the fact that childhood obesity is one of the long term effects of forced migration post-settlement in developed countries, with many studies showing an association between weight gain and the time since arriving to the developed country (Rhodes et al., 2016). In addition, as the intervention was preventative and targeted at parents, we took the pragmatic approach of targeting parents of younger, more dependent children and exclude semi-autonomous teenagers and older children.

Table 5.1: *Characteristics of Participants*

Pseudonym	**Age (years)**	**Country of origin**	**Years lived in UK**	**Education level**
P1	30	Syria	9 years	Primary School or less
P2	43	Syria	4 years	Primary School or less
P3	28	Syria	4 years	Primary School or less
P4	28	Syria	4 years	Some high school
P5	44	Syria	3 years	Primary School or less
P6	37	Syria	4 years	Primary School or less
P7	21	Syria	3 years	Primary School or less
P8	30	Syria	5 years	University degree
P9	54	Syria	4 years	Some high school
P10	50	Syria	4 years	Some high school
P11	34	Syria	3 years	University degree
P12	40	Syria	7 years	University degree
P13	30	Syria	4 years	Some high school
P14	35	Syria	8 years	University degree
P15	33	Syria	4 years	Primary School or less
P16	32	Syria	3 years	Primary School or less
P17	26	Syria	3 years	Primary School or less

P18	34	Syria	4 years	Some high school
P19	37	Kuwait	6 years	Primary School or less
P20	26	Libya	5 years	University degree
P21	38	Sudan	5 years	Primary School or less
P22	32	Sudan	4 years	Primary School or less
P23	30	Sudan	3 years	Some high school
P24	40	Sudan	4 years	Primary School or less
P25	30	Iraq	5 years	University degree
P26	29	Eretria	5 years	Some high school
P27	32	Tunisia	8 years	University degree

Procedure

Ethical approval was granted by a University ethics committee (2019-6539-10925).

5.3.4 Data transcription and analysis:

Among the twenty-seven interviews, 26 were conducted in Arabic and only one in English. Data from the interviews were audio-recorded with the participant's consent and transcribed verbatim directly to English. To ensure translation quality assurance a professional translator conducted a comprehensive, independent cross-check (Lincoln & Gonzalez y Gonzalez, 2008; Squires, 2008; Wong & Poon, 2010). To encourage parents to speak freely about their experience and to increase trust in the researcher, participants were made aware that the interview was confidential and non-judgemental and that there were no right or wrong answers. The right to withdraw was clearly and continuously emphasised and participants were also be made aware that participation is entirely voluntary. Before, during and following the study, participants had opportunities to ask any questions that they might have.

Parents' views were analysed using thematic analysis (TA). We chose this approach because it is useful for summarising key features and generating unanticipated insights (Braun & Clarke, 2006, 2021). We followed the six phases proposed by Braun and Clarke which consist of: 1) data familiarisation and writing familiarisation notes; 2) systematic data coding; 3) generating initial themes from coded and collated data; 4) developing and reviewing themes; 5) refining, defining and naming themes; and 6) writing the report. In phase one, interviews

were read several times and make notes about what was interesting or relevant to our research questions. This allowed the researcher to become familiar and engaged with the data. In phase two, a more formal coding process was conducted, which involved discussion and modification to the codes between the research team. In phase three, we collated codes featuring similar contents into initial themes. In phase four, Themes were developed and reviewed within the research team. In phase five, we refined the developed themes further which included defining and naming them. The data was organised with NVivo11 software (Edhlund & McDougall, 2016). Furthermore, establishing the trustworthiness of the analysis is considered a key concept in qualitative research, which is as Lincoln and Guba (1985) describes, a way of assuring the reader that research findings are grounded in the data(Lincoln & Guba, 1985). Lincoln and Guba (1985) introduce the criteria of credibility, transferability, dependability, and confirmability to fulfil trustworthiness which is considered one of the widely accepted and easily recognised criteria(Nowell et al., 2017). In an attempt to ensure that the analysis was conducted in a rigorous and methodical manner to yield meaningful and useful results a step-by- step approach to conduct a trustworthy thematic analysis developed by Nowell et al. (2017) was followed, in which the analysis process involved sharing the initial codes with other researchers in the team who regularly met to discuss and refine the coding and thematic framework and refined it(Nowell et al., 2017).

5.3.5 Reflexivity

Throughout the study, the research team met regularly to share reflections on their positionality in relation to the incoming data and analysis. The team were all female with a background in psychology, and had varying levels of experience in conducting qualitative interviews with diverse communities. We considered the concept of insider/outsider-researcher status, reflecting that this is better conceptualised as a continuum rather than a dichotomy (Breen, 2007). Whilst none of the research team had lived experience of forced migration, the lead researcher (who undertook the interviews and led on the analysis) identified as Arabic and had relocated from a country, with a culture similar to the study participants, to live in the UK. The remaining researchers identified as White British. Three quarters of the research team had lived experience as parents of young children. Pertinent reflections from the lead author on her positionality are provided below:

"Form the early stages of this research, I was aware of the influence of my background as an Arabic researcher on the direction and interpretation of the research results. As a female researcher from a similar culture to the population under study, as well as speaking the same language and having a similar experience of being from a developing country and resettling in a high income country, meant that I was likely to have a better understanding of their experiences. At the same time, it was important to recognise and be aware of the influence of my personal perspective and experiences on the research. During the interviews, my role was the primary researcher and I also allowed myself to connect to the participants as a mother with young children (I considered myself as insider), which had a positive impact on the recruitment process, as well as fostering engagement and building the rapport with the refugee parents. However, I felt that my experiences were very helpful in understanding the challenges that they faced in the resettlement period. In addition, my deep understanding of the culture and speaking a different dialect of the same language allowed me to be accepted by the refugee community, facilitated the recruitment and, perhaps most importantly, reduced the misunderstandings and miscommunications usually associated with the ethnic minorities research. However, being a female researcher from Saudi Arabia acted as barrier to the recruitment of a sufficient sample of fathers in the study. I sensed that when I approached fathers, they would ask me to speak to their wives instead, which likely reflected some level of gender effect and certain cultural norms (Hayfield & Huxley, 2015). Although this position was considered an advantage as it enabled more straightforward access to authentic data and a deeper understanding of the culture of this hard-to-reach population, there was a potential risk, especially during the data analysis, of overlooking parts of the data where assumptions around the content are chard(LaSala, 2003; Perry, Thurston, & Green, 2004).

5.4 Thematic Analysis Results

Twenty seven parent refugees participated in the study, 81% of them were mothers. Their age ranged between 21 and 54, and all of them were married. 55% of the mothers reported having only a primary school education, 31% reported having a high school education, and only 14% had a university education. 90% of the participants were currently unemployed. These parents had resettled in the UK as refugees for more than 3 years.

The analysis identified three broad themes within the data: 1) Reflection on acculturation under this theme, there are two sub-themes (Navigating the changed environment , changes in meal

routine and navigating new norms and assumptions). 2) Changed parental role under this we have three sub-themes (Adjusting parenting role and responsibility, Control of food choices, Awareness of change). 3) Environmental barriers to being healthy under this theme there is two sub-themes (Food availability and School environment).In the sections below, each are described in turn and supported with illustrative examples from across the data set.

5.4.1 Reflection on acculturation

Parents talked about some changes in their new life in the UK. These changes included changes in their environment, roles, eating patterns and types of physical activity. There were differences between the environments of participants' home countries and the UK which required parents to adjust their roles and responsibilities accordingly.

5.4.1.1 Navigating the changed environment:

Having relocated to a new environment, refugee parents face profound changes to their lifestyle and personal context, many of which can directly or indirectly influence health behaviours. Several changes were identified, including living space, inclement weather, and restricted neighbourhood/community.

All participants expressed clear differences between their lifestyle pre-settlement and post-resettlement, reporting that they used to live in safe, close-knit communities in their home countries. However, despite experiencing life in war zones and traumatic journeys to their host countries, refugee parents stated that they still felt that their old communities were safe and close-knit. It is interesting to note that, despite experiencing war, these families refer to their home community and home neighbourhood prior to the war as being safe. These feelings of unsafety and unfamiliarity with the customs and culture of the host country manifested in a reluctance to let their children play outside and interact with the neighbours. This was attributed to restricted access to the wider community; limited or no access to opportunities to meet or get to know other people were implicit in the narratives of participants.

> *"While here we do not have social relationships with friends or relatives like in Syria so we do not visit people and spend time together so my children feel bored and we do not have anything to do in vacations (P1)"*

The concerns that parents expressed about the safety of their neighbourhood may have had a detrimental effect on the levels of physical activity among their children. Additionally, many parents were wary of their children speaking to strangers or adopting bad habits from others in their neighbourhood. This could be a result of their history of traumatic experiences, particularly exposure to war, and their corresponding protectiveness toward their children. The other important point implied here pertains to their feeling unsafe in outside spaces, which also restricts opportunities for outside play.

> *"It is considered as a new place for us here and we are afraid of our children when they go out to play at a park since we do not want them to talk to strangers or learn bad things. (P12)"*

One father explained reasons for restricting their children from playing outside, including the perceived fear that the different environment was unsafe or that they were cautious of the neighbours and did not wish to cause disruption.

> *"British people have their own routine here, but we do not have such a routine here. It is considered as a new place for us here and we are afraid of our children when they go out to play at a park since we do not want them to talk to strangers or learn bad things. (P17).*

Most participants commented on the ways that the weather and restricted living spaces affected their children's physical activity. Participants came from countries with mostly hot climates, meaning that they had to adapt to the colder, wetter UK climate. The new climate discouraged participants from allowing their children to be outside for long periods of time, particularly in the winter, the consequence of which was that their children less active than in their countries of origin.

> *"The weather actually plays a key role here since the rainy and cold weather makes my children eat too much and they stay at home with not doing any kind of activity. (P15)"*

In their home countries, refugee families typically lived in wide, open areas, such as farms or rural communities. These provided more opportunities for their children to play safely and be active. In contrast, their houses/flats in the UK were much smaller, with comparatively less space for activities. Post-resettlement, these families usually have low incomes, which means they cannot afford spacious homes; therefore, they live in smaller homes/poorer living

conditions. Thus, they are more likely to be exposed to gang culture, drugs, etc., consequently, they are less inclined to let their children outside. Participants described how their children's play was restricted inside their homes, with very limited opportunities to play outside.

> *"I mean they used to play in big houses and the weather was good when we were in Sudan where they were more active than here. My children do less physical activities here as the size of our house is small and we do not have a garden or space at our home where they can play in (P3)"*

5.4.1.2 Changes in meal routine

Participants described critical changes in their new lifestyle post-resettlement, and one of the main changes was apparent in the narrative, the daily meal routine of the families. Most families share the same culture, which considers meal time a social event where the whole family sets with each other several times per day. Most of the families expressed that the number of meals they ate together was reduced from three meals to one, typically the evening dinner, after resettlement in the UK. They explained that the long school day in the UK means that children sometimes have their breakfast and lunch at school, only sharing the evening dinner together. These mothers compared their meal routine here in the UK and back home; they explained how they used to sit and eat three meals together as a family, and that created an opportunity for parents to observe and impact their children's diet. Some mothers explained how they would have the time and support to prepare proper meals for their families. They highlighted that they used to eat together with their extended family three times a day which means that all the children would encourage each other to eat and finish their plates. Therefore, this change adversely affected their ability to exert control over their children's diet.

> *"We used to eat three meals together every day in Syria, but here we only eat together in the dinner time since the breakfast and lunch meals are eaten outside the home. (P 10)"*

Social life and relationships are considered essential to these families especially since they used to live with their extended family back home, so they used to eat together, and that changed here after they moved to the UK. One mother explained how she faced difficulties at the beginning in contacting other people and her feelings about leaving her family behind.

"I was crying when I first moved to here since it was a new place and I just left my beloved family. Also, I was struggling with contacting people in English language and I was shy when I go out or when I go to a hospital. I feel much better now and I want to learn more things in this country(P11)"

This quote shows how they feel after they were forced to move away of their families for the first time. This big change in these families social life affected their meal routine and as result their diet in general. One of the impacts was the quantity of food prepared from scratch and eaten together as a family was reduced, as they had no need to prepare large meals that could feed a big family or last for several days or that can be shared with neighbours and guests.

"*There are a lot of changes, for example in Sudan we eat and prepare a lot of food and I used to cook large quantity of food but we do not eat a lot because we share it with guests and neighbours. So here I cook small amount of food so I only prepare what my kids love (P 1)"*

Participants explained that this change was mainly due to their limited social life in the UK, which meant that these mothers would only make one small meal for their families. In addition, the narrative also uncovers changes in the type of meals they would prepare, in which they do not prepare some of their traditional dishes that takes a long time to make, instead they learned how to make simple and quick meals that suit the busy lifestyle in the UK. Some mothers explained how their children's taste preferences changed after they moved to the UK and that could be informed by the changed environment. For example, this mother shared she noted that the taste of her children had changed a lot and now they want to eat the food that they see in the host country. This shifting preference could reflect children desire to 'fit in' and avoid being different.

"Our food system has changed when we moved to the UK. For example, we used to eat (labnah), olives, cheese, hummus, and falafel at the breakfast, but now my children do not eat such food and they prefer eating pasta and pizza to the Syrian and healthy food such as vegetables or rice, they like to imitate their friends at school and buy what they bring with them to the school.(P13)"

However, this was not the case for all the families, some of the parents who moved to the UK when their children were a little bit older (i.e. Older than 6 years) expressed how they would

prepare school-packed lunch for their children since they did not like school meals. This mother explained how her older children did not like the food at school.

"my other children were too annoyed of this and they did not like the food at their schools.(P13)"

It was clear from this quote that younger children are more likely to adopt the habits and behaviours of the UK. It may be due to the fact that they have little memory of their pre-settlement lives, so their eating habits have become like those of children in the UK. As compared to older children who were more familiar with their traditional food.

5.4.1.3 Navigating new norms and assumptions

Assumptions and norms around health held by participants could contrast with those experienced in the UK context. These focused on what food is acceptable to eat as part of a healthy diet and healthy body shapes.

Participants cited living in rural areas in their home countries, where fresh and organic food was ubiquitous. After resettling in the UK, organic food remained the preferred choice, however identifying and purchasing organic food was more challenging. Participants were sceptical about the chemicals and processing methods used in some foods, leading them to question whether the non-organic food that was more accessible in the UK was safe and healthy for them and their children.

> *"I felt there is a huge difference for example when I go shopping for vegetables I take long time and I wonder whether these vegetables were genetically modified or not? Was it organic or not? These questions really worry me. During grocery shopping you find different kind of food from different countries and that make me confused and I ask myself which one is suitable for my kids' health (P23)"*

Parents' cultural beliefs about body shape affected feeding practices and their children's eating patterns. Some parents stated that they associated thinness with hunger and living during a war, whereas heavier weights reflected health and stability. Therefore, participants perceived that eating more and gaining weight were positive signs of good health.

"And their health is much better than when were in Syria they used to be really thin but now they gain more weight and eat everything.(P12) "

Another mother emphasised this cultural belief regarding body shape, when she compared her children weight between when they were in their home country and now after five years post resettlement.

"We have been here for five years and my children are in good health and their weights increased a lot comparing to when we first moved here. It depends on the mother and her way of feeding her children.(P3)"

5.4.2 Changes to parenting

This theme denotes the parental influences on children's health behaviours, which include whether they noticed changes in the health behaviour of their young children, how their own eating habits had an influence, and what they considered healthy and unhealthy.

5.4.2.1 Adjusting parenting role and responsibility

Clear differences in gender roles were identified in the narrative. For example, some mothers stated a belief that their role has changed after their resettlement in the UK. Many had come from markedly different cultures, such as the Syrian culture, where mothers are responsible for raising the children, while fathers are the head of the family (i.e. in charge of the budget and did the shopping).

Some mothers stated that after moving to the UK, especially after a few years post-resettlement, they had extra responsibilities in the family. For example, many mothers explained how here in the UK they become responsible for shopping, which had previously been the role of men in the family; they explained that this change was after few years from settling in the UK because in the first period after resettling fathers usually have all the responsibilities until their families settle down and mothers feel more confident in sharing some of these responsibilities. This mother shared the shift in their responsibility by explaining how her husband used to buy in the beginning the general food but then she took that responsibility.

"In the beginning, their father used to buy some general food, then I started to buy what my children like and I also buy their preferred food. For example, they like

rice and sweets, so I try to purchase the food they like every time I go for food shopping.(P6).”

In regards to mothers taking more responsibility, there were some conflicting views. In some cases, women who took on extra responsibilities felt more dependent on their husbands, while others felt the burden was added.

“In Syria, my husband used to buy me all the ingredients that I need to cook but now I have to go by myself to buy the groceries here and it is very difficult to find some of the Arabic (traditional) ingredients (P4)”

Participants suggested that because fathers need to work late or simply did not consider matters pertaining to food, this led mothers to take on extra responsibilities.

“Actually, because my husband works until late, so I always buy food by myself most of the time. I play an important role in food shopping. (P11)”

Some of the mothers made it clear that they hold the responsibility for diet and feeding their children.

“I am controlling their food consumption. I usually make some sweets for my children at home and cook what they like since it is a clean food that made at home.(P8).”

Other mothers experienced a conflict in the feeding practices between them and the fathers. This quote explains that further.

“Their father buys them such unhealthy food as he likes them and he said he wants to provide them with everything they want (P15)”.

Participants perceived that fathers were responsible for physical activity. In their culture, fathers are typically the main source of authority, especially if they were in a different country and, therefore less aware of the local culture and language. Some interviewees stated that their husbands were supportive and that they encouraged their children to engage in activities by taking them to activities like swimming and football.

"My husband always asks them to do different activities at home and also he encourages them to eat such healthy food. He is helping me in their food and their physical activity as well (P 13)"

However, other fathers explained how they do not allow their children to play outside the house, which greatly restricts their physical activity. One father stated that he does not allow his children to play and he meant by that the street in front of his house and mentioned some reasons which were mentioned before by other parents which include (feeling of unsafety, busy lifestyle).

"I cannot allow them to play at the street on their own here as I feel it is not a safe place for playing. However, I used to leave them playing in the street when we were in Sudan and I was not worried at all because it was my country (P21)"

Parents felt that their own habits influenced their children. For example, they stated that they were themselves tempted to buy unhealthy foods because of the relative affordability of these products, easier access to a range of cheap options, and argued that this can negatively influence the eating habits of their children.

"I used to bring sweets to home in our first days in the UK as we just move to a new environment. For example, my daughter gained weight because she is eating such unhealthy snacks and then I asked her to stop eating more sweets. A child does not know what is good or bad for his or her health, so they eat what they find in the front of their eyes (P 8)"

Parental differences can have a variable influence on feeding practices, such as in the situation when only one parent is healthy or has healthy behaviours. These changes can be understood in terms of key issues, as discussed below.

5.4.2.2 Snacks as a reward to compensate for hard times

In the narrative, it was clear that some parents would use food provision to communicate their emotions to their children, where they sometimes use snacks and sweets to show love and care. In particular, many stated that their children had experienced hardship and deprivation in their early experiences of war and during their journey to the UK. Hence, the parents used food as

both a reward and a means of compensating for the hard times that their children had experienced.

> *"Honestly I can't deprive my children of having anything they really want especially they have been through a lot during war and so on I really feel sad for them when they ask me, so sometimes I allow my son to buy snacks (P10)"*

Participants expressed a lack of control over the quantities of food and compassionate with their children when they ask for more food.

> *"It's very hard to control the child when you feel hungry you just can't you know you cannot refuse giving him food that's only a child but here the only thing that we can manipulate with is the type of that food (P22)"*

5.4.2.3 Control of food choices

Participants noted the different strategies that they had adopted to control food choices and limit selections exclusively to traditional dishes. One mother even reported the use of more forceful techniques to ensure that her children ate foods from their home country. For example, some mothers mentioned forcing their young children to drink milk. In these situations, traditional food was presented as positive and healthy.

> "*Sometimes I force them to eat what I have cooked, even if they said they are full I tell them that they have to eat at home… My daughter doesn't like milk so I force her to drink it. (P10)."*

Other parents offered more choices to their children, such as cooking more than one dish for each meal as a way to encourage their children to eat. However, this approach may have caused some parents to lose control over the eating practices in their households, effectively resulting in the children controlling their own diet.

> *"I buy what they want to eat to break the routine when they do not like the dishes that their mom cooked so we go to restaurant but most of the time we take away the order to let my son eats with us as family (P 16)"*

5.4.2.4 Awareness of change

A minority of parents were unaware of any changes to their children's diet or activity levels. However, some parents had noticed changes in their children's diet and physical activity levels. Within this group, some believed that such changes were negative and could be linked to health consequences, such as weight gain and dental problems. This was more prevalent in parents who could see the direct effect of unhealthy eating, such as toothaches, which caused them to feel more anxious about change and more willing to acknowledge the effects of these changes.

> *"For example my older daughter she is sweet tooth and love eating too much of chocolate then she noticed that she is putting on weight. So now she starts to cut chocolate off and do more exercise I think she does not want anyone make fun of her weight my children really sensitive especially after what they been through (P 14)""*

Other parents perceived the changes to be positive, noting that there are more opportunities to eat healthily in the UK and that their children had become more active in the post-resettlement period.

"There are more chances where we can eat such healthy foods here. First of all the environment here very clean I can trust the vegetables and fruits and anything I eat it here (P20)"

5.4.3 Environmental barriers to being healthy

This change that had occurred post-resettlement had influenced the eating habits of these refugee families and their children. On the other hand, some parents explained how the availability of different types of food was perceived as positive.

5.4.3.1 Food availability

Most of the mothers explained how the availability of different types of food in the UK, especially in supermarkets, offered more choices to them. This positively impacted some families; they explained how this provided a greater choice to them and allowed access to an array of foods that were not previously available.

"We found out that the food options here are various. For example, there are many kinds of food here where we only used to have one product's type in my home country such as the buttermilk, lettuce, and beans (P 14)"

In addition, parents explained how they could access healthy options that were not available in their home country, such as avocado

"we eat healthy food here like avocado as the prices are very affordable and available all the year round incomparable to Syria where we only used to eat seasonal fruits and vegetables. I read online information about healthy food and I buy them for my family. I used to have organic food as I lived in a small village in Syria and the food was very fresh.(P14)"

While other mothers perceived the availability of different types of food in the supermarket as a negative thing. Some participants (more than one) felt that their lack of familiarity with certain foods could be confusing, particularly when individuals had limited language skills, as this could exacerbate the challenge of sourcing key ingredients and further limit their options.

This picture (pointing at one of the pictures that describes a refugee women looking at lots of options of pasta). When I first come here, I was suffering from finding some food that I do not know its name in English and I just buy food that I know like flour and eggs. This photo really describes me when I was looking for food (P 2)".

In addition, other mothers felt that the combination of having more money here in the UK and how the sweets and other unhealthy snacks were cheap were among the reasons for consuming lots of unhealthy options. This mother explained how they were tempted to buy unhealthy foods because of the relative affordability of these products or ease her access to a range of cheap options.

"This might be because of the cheap prices of sweets and snacks compared to Syria. We have a good income here that helps us to buy what we want at any time (P3)"

Another mother shared her experience with her daughter and how her consumption of sweets has increased as a result of the availability of these types of snacks and argued that this has negatively influenced her daughter's eating habits and led to an increase in her weight.

"Actually, they eat too much chocolate and sweets here and my daughter's weight has increased a little bit. We had control on their food when we were in Syria. However, they find sweets and chocolate easily here. They become more addicted to such sweets.(P5)."

Another mother compared their consumption of sweets in their home country and here in the UK to show the big shift in their eating habit.

"The food quantities are increased and become more than what we have used to eat in Syria. For instance, we used to buy sweets only in Eid's time (Muslim's celebration after fasting Ramadan), but now they are available all the time here.(P14)"

The availability of ready-made meals and snacks that suit the busy lifestyle here in the UK were also reasons mothers mentioned behind their increased consumption of these snacks and pre-prepared meals here in the UK. One mother mentioned how these ready-made meals are simpler to prepare for time-restricted families.

"Another thing they love snack because it is on the go they do not set on the table and follow certain rules (P 1)"

5.4.3.2 School environment

Participants expressed the importance of schools in raising the awareness regarding eating healthily, and parents explained how the teachers actively raised awareness regarding eating healthy meals. For example, one mother expressed that she must be careful about the lunch she sends to her young children at primary school.

"Their teachers sometimes send a note with my children if the food is not considered as a complete meal that contains of protein and carbs (P3)"

"At school, my children learn healthy eating habits and this help them to be aware of what is a healthy food and what does it consist of (P5)"

On the other hand, some parents perceived that even though the schools have a role in raising the awareness, most schools fail to provide healthy options and so they prefer to send their children to school with food prepared and packed at home.

"My children's school plays a key role in raising their awareness of eating healthy food, but their school sometimes serve unhealthy food that it is frozen and loaded with preservatives such as chips and pizza that are full of carbohydrates (P15)"

In addition, participants shed a light on schools' role in influencing children's physical activity. One mother mentioned how her young children do more activity in school days.

"In school days they do a lot of activities, but when they come back home they usually feel tired and do not do much, so I feel sad for them and leave them to have a rest (P10)

5.5 Discussion

This study contributes to the limited literature around refugee experiences, specifically relating to the health behaviours of refugee families with young children. Prior studies have noted the importance of parents' role in influencing their children's diet and physical activity. Therefore, this study aimed to explore the experiences and perspectives of refugee parents regarding health behaviour changes (i.e. changes in diet, levels of physical activity) and the impact of these changes on the weight of their young children. This is the first study that has focused on the role of parents in the diet of young children (aged 2 to 12). Our findings discussed parents' reflection on acculturation, and changing parental roles and environmental barriers to being healthy. The results of this study indicate that these parents experienced lots of forced changes by their new environment and that these environmental changes affected their children's health behaviours. Parents also reflected on their changing role in influencing their children's diet and level of physical activity.

The current study found that parents hold the perception that the new environment is restricted and unsafe, especially outside, which negatively affects their willingness to allow outside play, thereby reducing the physical activity of their children. Participants explained how the cold and rainy weather in the UK has been one of the reasons restricting their children's physical activity. In addition to climatic factors, participants noted that their children have become less active in response to the safety of their new living environments, despite the fact that many of these families experienced some dramatic events during their journey to the UK. According to their responses, past experiences have influenced the participants and their families, shaping the ways that they interact with their new living environment. This is consistent with other

qualitative research conducted with refugee populations and immigrant caregivers in the US, which found an emphasis on the caregivers' perception of the host community as being less safe than their living situation prior to migration(Dawson-Hahn et al., 2020; Masten & Narayan, 2012). This perception could be related to a history of stress and trauma, particularly the experience of living in a period of war and in refugee camps. After migration, refugee parents referred to having issues with knowledge about and trust in the food in the host country, creating issues in easily accessing these fresh, non-processed foods and organic foods grown without pesticides, especially in comparison to their home country. These results support observations in earlier studies on refugee parents settling in the USA, which found that there was an emphasis on fresh food in their traditional foods, contrasting with limited access to and different taste of fresh food in the traditional American diet (Tiedje et al., 2014; Vue et al., 2011). However, some contrasting views regards the availability of non-seasonal food around the year and international items of foods which was perceived in a positive way by some mothers. This interesting finding echoed previous research in the literature which has shown that younger migrants feel enthusiastic about the different types of non-seasonal food options and international options, both of which are expected by the young generation. In our study, it was interesting to see mothers perceiving these options positively(Wilson et al., 2010b).

An important finding was that refugees had needed to modify their roles and responsibilities to cope with their lifestyle changes. Such changes meant that these parents could be burdened by extra responsibilities and changing roles. Mothers explained how they were responsible for shopping and cooking, meaning a correspondingly greater responsibility for the diet of their children, whereas the fathers were deemed to have greater responsibility for the physical activity undertaken by their children. These changes resulted in less time to prepare meals and be active with their children. This finding is consistent with multiple studies that have shown that refugee families can experience rapidly changing roles as parents and children adjust to their new location, context, and culture (Renzaho et al., 2011; Simich et al., 2010; Stewart et al., 2012). This analysis relates not only to the social and physical environments in which families from refugee backgrounds live but also to the attitudes of the host community (Marlowe, 2011). Moreover, Deng and Marlowe (2013) showed that refugee parents commonly experience changes in their family dynamics after their resettlement, especially in terms of their roles in the family(Deng & Marlowe, 2013). Furthermore, refugee parents reflected on the indirect impact of their own diet and eating practices on the diets of their children. Mothers explained that their diet and cooking ways had changed in response to their

new living environment. This supports the findings of Romanos-Nanclares et al. (2018), who showed that parental eating attitudes influence the diet quality of children(Romanos-Nanclares et al., 2018). After migration to the UK, refugee parents described referenced using emotional feeding practices where they use unhealthy snacks to attempt to communicate support to their children, as well as to compensate for the harrowing events that their children had experienced prior to relocation in the UK. This finding supports previous research into ethnic differences in parental feeding behaviours, which found that ethnic minorities in the UK, especially South Asian parents, commonly scored higher on emotional feeding (Gu et al., 2017).

In the transition from pre- to post-migration, refugee parents showed that they had an influence on their children's diet and physical activity. Some mothers in this sample described how they used to live in rural areas in their home country, and this was related to conflicting beliefs about what they considered a healthy food, especially organic food. These mothers define healthy food as being organic only and this definition was informed by their previous environment. Some parents shared issues accessing organic food because of the prices and unfamiliarity and how these beliefs lead to restrictions of their food choices. This aligns with the literature, which demonstrates that refugees and immigrants hold perceptions around what is considered a healthy food, as well as including discussions around the definition of organic food (Dawson-Hahn et al., 2020); this played a part in shaping and restricting their food choices and consumption, as well as their diet in general.

Another interesting finding was the contrasting views between parents regarding their children's weight changes. Some parents expressed cultural beliefs regarding body shape, where some mothers explained how they connected to hunger and living through a war with being thin, while heavier weights represented health and stability. This result echoed the wide literature where previous research showed how immigrant's parents hold cultural beliefs regarding body shape. A recent systematic review on the cultural influences on childhood obesity in ethnic minorities found that the majority of ethnic groups believed that chubby babies are signs of good parenting (Chatham & Mixer, 2020). However, some mothers were concerned that their children were gaining weight and that it could be unhealthy. These mothers reflected on their influence on their children's dietary intake and weight. This contrasting could be because the different levels of acculturation between parents. This was supported by previous research that has suggested that this may be related to acculturation levels and their influence on parents' awareness levels(Chen et al., 2011).

Overall, the findings indicate that refugee parents viewed their new environment as restricted, leading them to adjust their roles and responsibilities accordingly, with a corresponding impact on the diet and levels of physical activity of their young children.

This study had a number of strengths. Primarily, it provided insights into the experiences of refugee parents and provided a valuable focus on the experiences of families with young children (aged 2–12). The use of photo elicitation interviews with refugee participants provided a viable, accessible way for participants to express and explain their experiences. In addition, this study provided an important opportunity to advance the understanding of the parental perspectives of refugee families regarding the changes in health behaviours from pre-resettlement to post-resettlement.

However, one of the limitations of the current study is that the sample involved more mothers than fathers despite the aim being to target both parents, based on a deep understanding of the importance of paternal impact on their children's health behaviours, particularly physical activity(Bond, 2019). However, there were many issues that affected the involvement of fathers in this study. Studies targeting hard-to-reach populations, such as refugees and specifically refugee fathers, require time to build a trusting relationship. Interviews especially require openness about a variety of very sensitive issues, such as parenting, gender roles and situations in their new country(Phares et al., 2006). Some fathers were reluctant to participate in the study. A number of reasons were cited, including insufficient time due to work commitments and a belief that their parental role was less important, as evidenced by multiple fathers informing the researcher that talking to their wives would be more appropriate. This could reflect the pattern of behaviour in this sample.

Future research could aim to increase the involvement of fathers, encouraging them to share their experiences and perspectives regarding their children's health behaviours and more specifically, changes in their children's levels of physical activity. Future research could seek to uncover the relationship between the impact of parental beliefs about what is considered healthy according to cultural norms and changes in terms of their children's weight gains.

Chapter 6. Development of a culturally appropriate intervention targeting health behaviours among refugee families with young children

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6.1 Abstract

Background:

Childhood obesity is a significant public health challenge of the 21st century, with 39 million overweight and obese children under the age of five in 2020. Refugee children settled in developed countries have seen a significant increase in obesity rates in recent years, highlighting the need for more tailored interventions. Following the Behaviour Change Wheel approach to intervention design and informed by systematic review, qualitative interviews and public patient involvement (PPI), the “Be healthy” intervention was developed to target refugee parents and support behaviour change among their young children.

Methods:

The “Be healthy” intervention design informed by a deductive analysis of (qualitative interviews, systematic review), PPI engagement, and using the Behaviour Change Wheel approach to intervention design.

Results:

The COM-B analysis of qualitative interviews identified that changes were required to the psychological capability of parents’ knowledge and memory, attention and decision processes in relation to supporting behaviour changes in their children. Analysis also highlighted the importance of ensuring physical opportunity, specifically in relation to the limited access to physical spaces for their children to be active. Time was also identified as a significant barrier for parents to support their young children to be more active, as well as impacting parental reliance on snacks and their lacking time to prepare healthy meals for their children. Social opportunity also required attention in relation to the impact of social influences (lack of social support and social pressure) on the behaviour changes of young children of refugee families. Finally, we have identified parental emotions as a barrier that could potentially hinder their ability or willingness support to behavioural changes.

In this paper, we provide a detailed description of how the “Be healthy” intervention was developed, based on theory, evidence, and the active participation of the public and stakeholder groups.

6.2 Introduction:

Childhood obesity constitutes one of the most serious public health challenges for governments in the 21st century, with 39 million children under the age of 5 either overweight or obese in 2020 (WHO, 2021). This condition is associated with increased health risks and poor health outcomes for children, such as hypertension, insulin resistance, orthopaedic problems, lower health quality of life, and psychosocial consequences (WHO, 2018a). There is also evidence that childhood obesity impacts the longer-term wellbeing of individuals, including greater chance of obesity in adulthood and increased risk of cardiovascular disease, diabetes, musculoskeletal disorders, and cancer (Freedman et al., 2007; Pinhas-Hamiel & Zeitler, 2007; Taylor, 2006; WHO, 2021).

While prevalent worldwide, childhood obesity is particularly prevalent among ethnic minorities who resettle in developed countries. In recent years, despite obesity rates among children in some countries like Germany and the USA beginning to plateau, some studies report that children from migration backgrounds continue to have higher obesity prevalence (Chatham & Mixer, 2020). In particular, a recent analysis has found that refugee families are significantly more likely to be obese after resettling in developed countries than at arrival (Kumar et al., 2021). With refugee numbers are on the rise, this poses a particularly significant challenge to the governments of the countries that host them, especially given that these vulnerable populations face many challenges that can undermine their health in general (Gichunge et al., 2016; Renzaho & Burns, 2006; Vue et al., 2011). However, little has been published on the relationship between childhood obesity and migration. Despite the increased prevalence of forced migration in recent years and the increased risk of negative physical consequences like obesity, there is a need for interventions to prevent childhood obesity among refugee children.

Understanding what influences health behaviour in this population is crucial to tailoring interventions to improve health outcomes. Contributing factors are complex and extend beyond socio-economic factors to include cultural or ethnic backgrounds, time since immigration and influences within the host environment (Alsubhi et al., 2020). In addition, a qualitative study explored parental perspectives of refugee families regarding the changes in health behaviours after resettlement found that parental perceptions related to acceptable weight ranges and what is deemed a healthy diet for children can also be influenced by cultural norms, as well as pre-immigration experiences (Alsubhi et al., 2022). The profound lifestyle transition that refugee families experience during resettlement typically includes new dietary patterns, with increased

intake of fat, sodium and sugary drinks (Lane et al., 2018; Sanou et al., 2014), and a shift to more sedentary lifestyles, both contributing over time to an increased risk of overweight among their young children. Refugee parents and children may therefore benefit from programmes that promote healthy lifestyles. Those are likely to be more successful if they account for factors such as cultural beliefs/practices and the diversity of experiences among refugee families. Consequently, there is a need to design culturally appropriate interventions for refugee families with young children.

In obesity prevention research, family-based interventions are recognised as an effective strategy to prevent and treat childhood obesity (Ash et al., 2017; Enright et al., 2020; Sung-Chan et al., 2013). Parents play an important role in shaping the experiences of their children regarding food, reinforcing eating and physical activity, influencing the availability of healthy food, and establishing family routines to support the development and sustainability of new healthy habits, especially with very young children (Walsh et al., 2015). This is especially important given that the early environments exert a powerful, long-lasting effect on children's health, including obesity development (Anzman et al., 2010). Prior to entering puberty, most excess weight is gained by children under the age of 5, highlighting the critical role early childhood experiences play in childhood obesity (Gardner et al., 2009; Hui et al., 2008; Monteiro & Victora, 2005; Ong & Loos, 2006). In light of this, early childhood is crucial in addressing health behaviours associated with childhood obesity (Anzman et al., 2010; Lanigan et al., 2010). Health policy in the United Kingdom supports this assertion by acknowledging the importance of early environmental interventions in tackling obesity (DepartmentofHealth, 2020; HealthCommittee, 2004; Hinchliffe et al., 2004).

The involvement of parents has also shown to improve health outcomes. Among refugee population, previous interventions have tended to focus on the importance of group programmes to reach out to families and the wider community (Renzaho et al., 2015b). This approach is predicated upon the fact that the eating practices of refugees are typically centred around and within their families and communities, meaning that it is crucial to educate the entire family and to organise related community activities (Wieland et al., 2018). Additionally, earlier research has emphasised the importance of a family-based approach when targeting refugee and immigrant populations (Bronars et al., 2017). However, relatively few studies have examined family-based interventions for the prevention of obesity among ethnic minority preschool children (2–5 years of age) (Wang et al., 2022).

Interventions focused on immigrants and refugees have primarily been multi-component approaches delivered face-to-face, through strategies like home visits and educational programmes undertaken in refugee organisations (Dulin Keita et al., 2014; Wieland et al., 2018). However, although these kinds of family-based interventions have proven to be highly effective in the treatment of childhood obesity, most have also been excessively costly and time-intensive, making them unsustainable or not scalable after the end of research funding (Dulin Keita et al., 2014). There is therefore a pressing need to develop and test early childhood obesity prevention and treatment approaches for refugee families that are not only effective, but also practical, acceptable, and sustainable.

The aim of this paper was to describe in detail the development process for the “Be healthy” intervention, which was designed in a culturally and linguistically appropriate way to target snacking and sedentary behaviours among refugee parents with young children, based upon the Behaviour Change Wheel (Michie et al., 2011).

6.3 Methods:

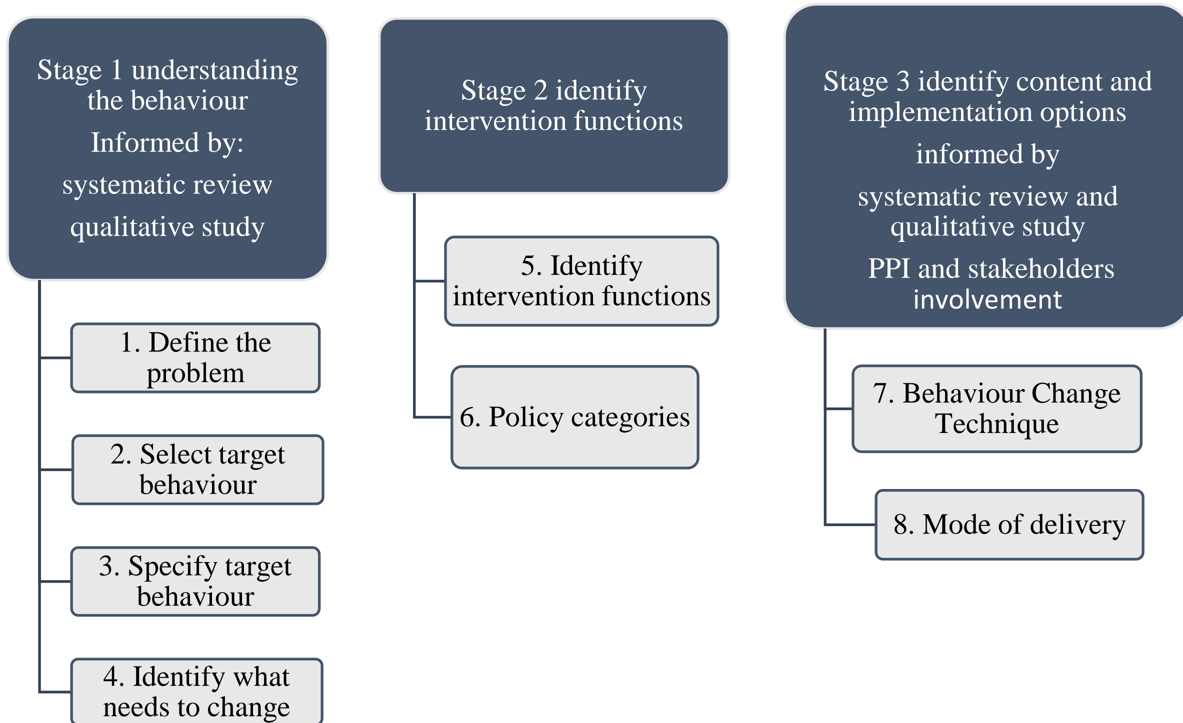
6.3.1 Design

This intervention design was informed by the Behaviour Change Wheel (BCW) (Michie et al., 2014), which is a framework for designing interventions.

6.3.1.1 Intervention development:

According to the BCW, the process of designing an intervention consists of three stages, which are subdivided into eight steps, which is summarised in Figure 6.1. The first stage is to understand the associated behaviour, informed by: a) a systematic review and synthesis of qualitative and quantitative evidence on the factors associated with obesity-related health behaviours among child refugees following their resettlement in developed countries; and b) an additional qualitative investigation into the health behaviours of young children from refugee families after their settlement in the UK. The second stage is to identify intervention functions and the third stage is to identify content and implementation options, based upon the systematic review and qualitative study, as well as PPI and stakeholder involvement.

Figure 6.1 Stages of The Behaviour Change Wheel



Stage 1: Understanding the Behaviour

1. **Define the problem in behavioural terms**

This first stage in the design process requires the specific definition of the problem in behavioural terms, which means identifying the population and the behaviour itself (Michie et al., 2014). This stage was informed by the results of both the systematic review and qualitative study, which were combined to help define the obesity-related behaviours of refugee children post-resettlement and the impact of this change on their weight.

A) Systematic review

A systematic review of all the qualitative and quantitative evidence in the literature was undertaken to identify the factors associated with obesity-related health behaviours among child refugees following their resettlement in developed countries(Alsubhi et al., 2020). The review found that the health behaviours of refugee families with young children are influenced by factors including: Acculturation, Environmental, Socioeconomic, Cognitive, and Family. The review also identified a number of factors influencing the health behaviours of refugees that are common amongst immigrant groups, but are especially prominent among refugees. For example, factors contributing to unhealthy food choices included poor food literacy, increased availability of unhealthy foods, and decreased availability of healthy foods. There were several factors related directly to physical activity, including poor weather, labour saving devices, and lack of value given to sporting activities. Multiple factors contribute to overconsumption of food, including temptation from an abundance of food and greater variety than what was available in their home countries, as well as overeating in response to previous food insecurity. In addition, the review revealed that parental practices influence children's health behaviours, particularly for those who are 2 to 10 years old(Alsubhi et al., 2020). Therefore, further research was required to better understand how parents affect the weight trajectories and health behaviours of their children after resettlement.

B) Qualitative study

We undertook research that aimed to explore the experiences and perspectives of refugee parents regarding health behaviour changes (i.e. changes in diet, levels of physical activity) and the impact of these changes on the weight of their young children. This research was based on the results from the systematic review to help identify the problem further.

Data collection for this study consisted of 27 semi-structured interviews, supplemented with the use of photo elicitation. In this study, there was a high degree of PPI involvement, especially in the process of generating the photos used in the interviews. Topic guides were informed by the social cognitive theory (SCT) and included questions that assessed: 1) participants' understanding of what comprises a healthy diet, descriptions of food and types of physical activity, food environment, and dietary patterns; 2) participants' perceived barriers to eating healthy food and being physically active for their children and as a family; and 3) differences in dietary patterns and levels of physical activity "back home" and in the UK. The data analysis

was conducted using thematic analysis (Braun & Clarke, 2021), in order to inductively identify the experiences and perspectives of refugee parents regarding health behaviour changes among their children. The inductive analysis and results have been reported elsewhere (Alsubhi et al., 2022).

2. **Select and specify target behaviour**

This step was informed by the information gathered through the systematic review and the qualitative analysis, which were used to identify the most suitable specific behaviours on which to focus the intervention. We identified the specific behaviours of most concern to the participants, then specified who needed to perform the behaviours (e.g. social workers and/or parents), what they needed to do, along with when, where, how often and with whom it should be performed.

3. **Identify what needs to change**

In this step, we specified what exactly needs to change to achieve the desired change in behaviour. Two distinct phases informed this step:

A deductive analysis was conducted of the data using the COM-B model to identify the 'target behaviour/s'. The themes from the qualitative analysis were revisited, specifically the themes related to the targeted behaviour, then mapped to the COM-B constructs: psychological/physical capability, social/physical opportunity, and reflective/automatic motivation (Michie et al., 2011). This deductive analysis was based on discussion and agreement with a team of experts in behaviour change.

Following the above analysis, behavioural diagnosis was conducted in accordance with the BCW guidance. This analysis highlighted the specific steps that are required in order for the new behaviour to occur, as well as determining whether changes to the current situation are necessary in order for the new behaviours to occur. The behaviours that needed to change were mapped onto both the sources of behaviour (Capability, Opportunity, Motivation) and the Theoretical Domains Framework (TDF) domains (Cane et al., 2012; Michie et al., 2005). The TDF was developed to better understand and enhance intervention implementation, and consists of 14 domains that cover cognitive, affective, social and environmental influences on

behaviour. Although application of the TDF is optional, it has been included to improve and enhance the understanding of the behaviour being targeted in the intervention.

This process enabled the development of a clear specification of who will perform the target behaviours, what they need to do differently in order to achieve the desired changes, where and when these actions need to be undertaken, and, if necessary, how often and with whom.

Stage 2. Identify intervention functions

2.1. Identify intervention functions

The BCW framework synthesis generated nine intervention functions, which represent the central ring of the BCW (education, persuasion, incentivisation, coercion, training, restriction, environmental restructuring, modelling, and enablement). To inform this step, a team of experts in behaviour change identified the most suitable and effective intervention functions based on mapping and linking the intervention function to the COM-B and TDF. For example, the psychological capability is linked with intervention function education. The intervention functions were then selected based on the behavioural diagnosis results.

Stage 3. Identify content and implementation options

3.1. Behaviour Change Techniques

Following the behavioural diagnosis and the selection of the intervention functions, the appropriate BCTs were selected. A taxonomy consisting of 93 BCTs (BCTTv.1) has been developed in recent years to identify and define these techniques. These BCTs are defined as "*an active component of an intervention designed to change behaviour*" (Michie et al., 2014, p. 145). Most of the behaviour change interventions in the literature are based on a group of behaviour change techniques (BCTs), such as problem solving and action planning.

Two approaches were used to identify the most appropriate BCTs: the first, guided by the list of the most commonly used BCTs for each intervention function; and the second, provided by the BCW framework, where the most appropriate BCTs were selected based on their relevance to the domains from the TDF (Cane et al., 2012; Michie et al., 2005). Although both approaches are appropriate, the first approach was used in selecting the BCTs, with some of the most

commonly used BCTs targeting *Education and Persuasion* are *Problem solving, Information about health consequences and Prompts/cues.*

3.2. Mode of delivery

One of the steps at this stage is determining how the intervention should be delivered, such as using phone apps, the internet, or posters. This involves consideration of whether the intervention will be delivered face-to-face or remotely, and at the individual, group, or population level. The selection of the mode of delivery took place in two phases: first, choosing the mode of intervention delivery which was guided by the APEASE criteria. These evaluation criteria were provided in the BCW guidance and include (affordability, practicability, effectiveness, acceptability, side-effects and safety, and equity). The initial option for the mode of delivery was face-to-face, because it would allow potentially obtaining more information about the intervention recipients and facilitate the process of following up on participants.

6.3.1.2 Patient public involvement:

The BCW recommendations emphasise the importance of PPI and stakeholder involvement in the intervention design process. This was a retrieval process, involving ongoing discussion with the PPI group, stakeholders and research team. From the beginning, PPI was involved with the intervention design process by way of a few face-to-face meetings at the refugee organisation, held with a group of refugee mothers of young children (N=7). In these meetings, there was a discussion of the targeted behaviours, usability and content appropriateness, as well as the mode of delivery. The aim of this review was to ensure that the intervention was tailored in a culturally and linguistically appropriate way.

Following this, the research team discussed and agreed on the first draft of the "Be healthy" intervention. A comprehensive discussion then took place with a group of experts in behaviour change including a health psychologist, in order to evaluate the intervention design further and ensure the accuracy of the content. In these meetings, the discussion focused on refining key dimensions of the intervention, which particularly involved the consideration of content (what was delivered), intensity (over how many contacts it was delivered) and duration (over what period of time it was delivered). An additional step involved meeting with potential providers (i.e., dietitian, primary teacher and social worker) to discuss the feasibility and suitability of

some of the dimensions of the intervention, such as provider (who would deliver it); setting (where it would be delivered) and duration (Michie et al., 2014).

The importance of this step is well documented in previous research, which has found that involving stakeholders as both participants and contributors increase the efficacy of reaching 'hard to reach' populations (Morgan et al., 2016), like refugees. This involvement has proven to enhance these interventions in terms of perceived '*equality and acceptance, and knowledge gain' and participants' sense of empowerment* (Warner et al., 2021, p. 131). Therefore, refugee involvement was considered essential in the development of culturally appropriate interventions.

6.4 Results

6.4.1 Define the problem in behavioural terms

In the introduction, we outlined the problem in general, which is the increased prevalence of childhood obesity rates among refugee populations after their resettlement in developed countries. The systematic review revealed that several complex factors influenced their health behaviours and these factors are common to immigrant groups; however, it seems to have a more significant influence on refugees. In particular, the review showed that the health behaviours of young children, especially those aged 2 to 10, are influenced by parental practices. Following this, the qualitative study revealed that refugee parents of children aged 2 to 10 experience many changes to their roles and responsibilities, and several environmental barriers to being healthy, such as the availability and affordability of unhealthy food options. These parents conclude that the health behaviours of most concern to them were increased sedentary behaviour and greater consumption of unhealthy snacks (Alsubhi et al., 2022). This was described by refugee parents:

> *"They [her children] eat unhealthy snacks like sweets and chocolate, and they also drink soft drinks as they are very cheap and available everywhere".*

> *"The weather actually plays a key role here since the rainy and cold weather makes my children eat too much and they stay at home with not doing any kind of activity."*

> *"In school days they do a lot of activities, but when they come back home they usually feel tired and do not do much, so I feel sad for them and leave them to have a rest"*

Based on the above, there was a need to focus on targeting these health behaviours. Therefore, the overall problem is defined in behavioural terms as improving health behaviour among refugee families with young children who resettled in a developed country. The people who were involved in performing the problematic behaviours included parents and their young children.

6.4.2 Select and specify the target behaviour

Two specific targeted behaviours were revealed. From the systematic review we have identified that parental practices have a significant influence on the health behaviours of their young children; the qualitative data suggest that increased sedentary behaviour and greater consumption of unhealthy snacks were issues of concern to parents. From these findings, we identified the main health behaviours that would be the most suitable goals to target for this population, namely reducing the frequency of snacks available to the refugee children each day, reducing the consumption of discretionary snacks, and reducing the time spent on sedentary behaviours (e.g., time spent watching TV, playing electronic games, using the computer). We selected and specified three target behaviours, summarised in Table 6.1.

Table 6.1: Target behaviours for "Be healthy" intervention

Who	What, when, where, with whom
Refugee Parents	Attend the sessions online, use the "Be healthy" booklet and use the behaviour change techniques with their children.
Facilitator	Deliver the sessions, explain how to use the booklet and follow up on their progress each session.

6.4.3 COM-B analysis

The objective of this analysis was to better understand the barriers facing parents in performing the behaviour change (i.e., reduce snacking frequency, choose healthier snacks and reduce the time spent on sedentary behaviours). These barriers are described below in relation to the COM-B constructs of Capability, Opportunity, and Motivation and the TDF domains, as summarised in Table 6.2&6.3.

Table 6.2. Mapping intervention functions to COM-B and Theoretical Domains Framework (TDF) components(snacking)

COM-B	Theoretical Domains Framework (TDF)	Sub-themes	Intervention functions	Behavioural change techniques (BCTs)	Example
Psychological capability	Knowledge, Memory, attention and decision making processes	Parents have a difficulty in making decisions on healthy snack choices.	Education, persuasion, Training	Problem solving Information about health consequences	Prompt the parents to identify barriers preventing them from choosing healthy snacks e.g., lack of motivation, lack of information on what snacks are healthy and where to buy them / the ingredients, and discuss ways in which they could help overcome them.
		Parents perceived snacks as way of compensating- (they feel indirect guilt towards their children).	Training, persuasion	Framing / Reframing	Suggest that not depriving children of snacks but actually looking after their health

		Lack of parents' self-confidence and Problem solving skills to support behaviour change.	Training	Instruction on how to perform a behaviour, Information about antecedents	Educate parents on the appropriate number, proportion, ingredients and times of snacks. Advise to keep a record of snacking and of situations or events occurring prior to snacking
	Behavioural regulation	Parents' regulation of their own snacking choices and their children. Parents' seeing self as role model for their children.	Training, enablement, modelling	Self-monitoring of behaviour Social comparison	Ask parents to record daily, in a diary, their consumption of snacks and their children.
Physical Opportunity	Environmental context and resources	Over exposure to unhealthy snacks	Environmental restructuring	Action planning Prompts/cues Problem solving Restructuring the physical environment	Encourage parents to put a plan to reduce buying snacks / chose healthier snacks when going out for shopping. Prompt planning to have snacks at a particular time (e.g. between meals)

					and plan what they will have as snack.
					Advice parents to keep biscuits and snacks in a cupboard that is inconvenient to get to.
Social Opportunity	Social influences	Unhealthy culture (Influenced by friends and school)	Enablement	Social support (unspecified) Restructuring the social environment	Encourage parents to build new social groups that support behaviour change, given the evidence that social networks can disseminate health behaviours and health outcomes throughout communities.
Reflective Motivation	Beliefs about capabilities	Parents have a lack of confidence in their ability to make changes to their children's dietary behaviours	Persuasion, training	Instruction on how to perform the behaviour, goal setting, feedback on behaviour, prompts/cues	Educate, persuade and enable parents to increase their self-confidence in making changes to their children's eating habits.
	Beliefs about consequences	Parents' difficulty in linking changes in dietary intake	Education, persuasion, Enablement	Information about health consequences,	Provide information (e.g. written, verbal, visual) about health

		(snacking) with health risks		Information about social and environmental consequences	consequences of performing the behaviour
Automatic Motivation	Emotions	Parents' guilt of restricting food choices.	Framing / Reframing, persuasion	Reduce negative emotions Monitoring of emotional consequences	Ask parents to record how they feel after reducing snacks occasions.

Table 6.3. Mapping intervention functions to COM-B and Theoretical Domains Framework (TDF) components (Sedentary behaviours)

COM-B	Theoretical Domains Framework (TDF)	Sub-themes	Intervention functions	Behavioural change techniques (BCTs)	Example
Psychological capability	Knowledge, Memory, attention and decision making processes	Parents' lack the knowledge of the negative consequences of sedentary behaviours.	Education	Information about health consequences, Instruction on how to perform the behaviour, habit formation	Educate parents about what considered sedentary behaviours (e.g. watching TV for long hours, playing video games) and the negative consequences of these sedentary behaviours. Encourage parents to identify barriers to reduce sedentary behaviours and discuss ways in which they could help overcome them (e.g. provide active video games to families to reduce time spent in traditional seated video games and total video game time).

Physical Capability	Skills	Lack of parental capacity and capabilities to support behaviour change	Training, enablement	Instruction on how to perform the behaviour, behavioural practice/rehearsal/, habit formation	Encourage parents to manage their time in order to create opportunities to encourage their children to be more active Prompt the parents to discuss ways in which they could help reducing sedentary behaviours among their children(e.g., active games, helping with chores, doing art projects, playing board games)
Physical Opportunity	Environmental context and resources	Lack of safe space in the community (worry about safety of the neighbourhood)	Environmental restructuring	Action planning Prompts/cues Problem solving	Encourage parents, through map drawing and photographic techniques (Orellana, 1999; Morrow, 2001) to set with their children and discuss home and community environments in relation to their sedentary and physical activity choices and opportunities. Promote parents to help their children to come up with activities that aren't sedentary and fairly quiet(e.g. playing interactive games, doing craft projects)
		Lack of space inside the house (live in Small houses)			Encourage parents to support their children to decrease sedentary behaviours

					inside the house (e.g. watching TV programmes that are interactive)
		Lack of affordability of different activities in school or out side			Encourage parents to work in small groups to identify barriers to reducing sedentary time e.g., don’t have time to play with children and try to generate solutions they also encouraged to draw from experiences from their own lives, if they want to
		Inappropriate weather to be active especially for young children			
Reflective Motivation	Knowledge, Memory, attention and decision making processes	No motivation/incentive to change behaviours in absence of immediate health problems.	Persuasion, training	Information about health consequences, information about social and environmental consequences Instruction on how to perform the behaviour.	

Automatic Motivation	Emotions	Parents desire to protect their children.	persuasion	Reduce negative emotions Monitoring of emotional consequences

6.4.3.1 Psychological Capability

1. Knowledge

One of the barriers that parents faced was a lack of knowledge regarding what constitutes a healthy snack and the most appropriate frequency of snacks for their children each day. For example, parents perceived the provision of discretionary snacks as a way of compensating for the hard times that their children had undergone, such as experience during wartime and traumatic journeys to the host country. This poor knowledge around the health consequences of unhealthy snacks was particularly highlighted in the interviews, for example one mother said:

> *"I can't deprive my children of having anything they really want, especially as they have been through a lot during the war and so on. I really feel sad for them when they ask me, so sometimes I allow my son to buy snacks."*

There was also a clear lack of knowledge regarding the recommended number of snacks that children should consume each day, as one mother highlighted in the interviews:

> *"They [her children] eat more snacks here, like chocolate and chips. I try to buy sufficient quantities of snacks on the weekend for the coming week, but my children eat them before and finish them quickly."*

A further lack of knowledge was observed in the interviews, with parents lacking awareness regarding the importance of physical activity for their children.

2. Memory/attention and decision processes

From the deductive analysis, it was clear that some parents paid attention to the increased consumption of unhealthy snacks by their children: *"I have noticed that they [her children] eat more snacks here (the UK)"*. However, one of the barriers to support behaviour change was a lack of self-confidence: *"I can say that I had good control over my children's food in Syria, but they eat what they desire and the food quantity that they want in the UK."*

Furthermore, even when some of the parents acknowledged the health consequences facing their children due to frequent overconsumption of unhealthy snacks, they still experienced difficulties in making decisions regarding snacking.

> *"The temptations of unhealthy food are everywhere and I think, as parents, you don't want to deprive your children."*

6.4.3.2 Physical Opportunity

1. Environmental context and resources

Lack of time was an issue that families cited in relation to cooking and preparing proper meals. *"In fact, one of the reasons is that both parents are working and they do not have much time for cooking at home"*. Therefore, parents perceived lack of time as a barrier to the preparation of meals, leading to greater reliance on snacks and eating pre-prepared meals. *"Another thing is they love snacking, because it is on the go, they do not sit at the table and follow certain rules"*.

From the analysis, many parents emphasise that the new environment discourages eating healthy snacks, which they attribute to over exposure to unhealthy snacking options. *"They eat unhealthy snacks, like sweets and chocolate, and they drink soft drinks, as they are very cheap and available everywhere"*. The availability and affordability of discretionary food was highlighted by participants as a barrier to eating healthier snacks.

Time was mentioned when parents talked about the physical activity undertaken by their children, with perceived lack of time acting as a barrier preventing them from being more active: *"I go to college four times a week, so I usually do many activities with my daughters on the weekends"* and *"Their father is always busy and he works all the time, so he usually goes out with them on the weekends"*. Therefore, lack of time represents a barrier to effective behaviour change.

A related issue was the lack of physical space, with a paucity of safe space in the community cited by parents as preventing their young children from being physically active. Some parents explained how they feel worried about the safety of the neighbourhoods in their new environment. *"I cannot allow them to play at the street on their own here as I feel it is not a safe place for playing. However, I used to leave them playing in the street when we were in*

Sudan and I was not worried at all, because it was my country." Furthermore, lack of space inside the house was highlighted by participants particularly who live in Small houses as a barrier to support behaviour change. *"We live in a flat where their movement is limited and they cannot play inside the flat since they will annoy our neighbours."* This issue was reported as being exacerbated by the lack of financial resources to afford different activities in school or outside, hindering the ability of parents to support their children in being physically active. *"Even if there is something available, I cannot afford it. These clubs cost a lot, especially when you have three kids."* Finally, the weather was reported as an environmental barrier to being active, especially for young children. *"They usually stay at home most of the time, since the weather is cold and rainy. I usually become worried about them since they can get sick easily here".*

6.4.3.3 Social Opportunity

1. **Social influences**

From the deductive analysis, it was clear that some parents believe that their children have a higher consumption of unhealthy snacks because of influence from their school friends. *"Everyone here eats them (unhealthy snacks) and because they see their friends eating snacks, so they come back and ask us to buy them the same".* This social influence represents the desire of refugee children to integrate into their new community, constituting a barrier to behaviour change.

Parents highlighted in the interviews the lack of social support to encourage children to play and be active, particularly in their new environment. *"Here we do not have social relationships with friends or relatives like in Syria, so we do not visit people and spend time together so my children feel bored and we do not have anything to do on vacations".* This isolation hinders the ability of parents to support behaviour change among their young children.

These social influences, represented by social support and social pressure, can act as barriers to eating healthy snacks and, at the same time, can be viewed as facilitators to support refugee children to be physically active.

6.4.3.4 Reflective Motivation

1. **Beliefs about capabilities/ consequences**

Some parents were not motivated to support dietary changes (reduce unhealthy snacking) among their young children. It was clear that they have a lack of confidence in their ability to make changes to their children's dietary behaviours, stating "*I cannot control their sweets consumption here (the UK)"*, particularly in the absence of health consequences. This was also the case when parents talked about their children's levels of physical activity, with an apparent lack of motivation or incentive to make necessary changes. These parents, particularly refugee fathers, prioritise their mindset by not worrying much about their young children over being active. *"It is considered as a new place for us here and we are afraid of our children when they go out to play at a park, since we do not want them to talk to strangers or learn bad things."*

6.4.3.5 Automatic Motivation

1. **Emotions**

Parents in general, and refugee parents in particular, have a strong desire to protect and provide for their children. *"My main goal is providing my children with what they want. This makes me feel happy"*. Therefore, these parents feel guilt when restricting food choices, with this feeling being considered as a barrier to necessary behaviour changes. *"I can't deprive my children of anything they really want, especially as they have been through a lot during war and so on. I really feel sad for them when they ask me, so sometimes I allow my son to buy snacks"*. The strong desire to protect hinders many parents from supporting their children to become physically active. *"I can't deprive my children of anything they really want, especially as they have been through a lot during war and so on. I really feel sad for them".* This parental emotional response was one of the issues that could hinder their support for behavioural changes.

6.4.4 Behavioural diagnosis

By mapping the research findings to the COM-B and TDF, we were able to identify what exactly had to be changed within this group setting to promote the target behaviours. We have

identified that these parents face barriers to supporting their children in making behaviour changes. These barriers lay in the Psychological Capability of parents' knowledge and memory, attention and decision processes in relation to supporting the required behaviour changes. In addition, we have identified other barriers related to their Physical Opportunity, specifically in relation to limited physical spaces for their children to be active. Time was also highlighted as a barrier for parents to support their young children to be more active, as well as in relation to greater reliance on snacks, linked to a lack of time to prepare healthy meals. Social opportunity also required attention in relation to the impact of social influences (the lack of social support and social pressure) on the ability of young children to make behaviour changes. Finally, we have identified the parental emotions as barriers that could hinder their support to behavioural changes. A summary of the links between what needed to change, the COM-B components and the TDF domains can be seen in Table 6.2 and 6.3.

6.4.5 Identify intervention functions

Based on the COM-B analysis, and following the guidance, four main intervention functions were identified: Education, Persuasion, Training and Enablement.

6.4.5.1 Behaviour Change Techniques

The selected BCTs are described in detail below, along with examples, rationales, and evidence. The list of the selected BCTs and linked to TDF can be seen in Table 3&4. Here we describe the selected BCTs in more detail, alongside examples, rationales and evidence.

6.4.5.1.1 Information about health consequences (5.1)

From the behavioural diagnosis, it was clear that one of the significant barriers that hindered parents in supporting their children in changing their behaviour was a lack of knowledge regarding the health consequences for young children of sedentary behaviour and frequent, unhealthy snacking. The education function was intended to address this shortcoming. Tailored, culturally sensitive information regarding these health consequences was therefore included in the intervention to ensure that parents were aware of the associated repercussions and so increase motivation for behaviour change.

6.4.5.1.2 Goal setting (behaviour, 1.1)

Based on the COM-B analysis, we chose to offer predetermined goals in an attempt to tackle many of the barriers identified. Goal setting was included in the intervention, since it has been identified as effective in enabling parents to support dietary changes among their children (Golley et al., 2011). Goal setting also has proven efficacy in supporting change across a wide range of behaviours (Epton et al., 2017). More importantly, goal setting has a significant effect on changing dietary behaviours, specifically in the promotion of healthy eating amongst populations with overweight and obesity (Samdal et al., 2017). In addition, specific goal setting was among the effective BCTs included in the interventions supporting parents to improve their children's weight-related nutrition intake and activity patterns. Therefore, three goals were included for both snacking and sedentary behaviours, focusing on helping parents achieve behaviour changes among their children by setting SMART (Specific, Measurable, Achievable, Realistic, Timely) goals.

6.4.5.1.3 Action planning (1.4)

Action planning was included to inform the enablement function and ensure that parental goals were achievable. Participants were asked to specify one of the behaviour's context, frequency, duration or intensity, as adding details can help to ensure that goals are not forgotten or neglected (Michie et al., 2014).

6.4.5.1.4 Problem solving (1.2)

Identifying barriers without considering solutions is insufficient (Michie et al., 2014). Therefore, problem solving was included to encourage parents to identify barriers and generate solutions to overcome these obstacles that were tailored to their specific situation and personal family context.

6.4.5.1.5 Instructions on how to perform the behaviour (4.1)

The "Be healthy" booklet included instructions on how to set SMART goals. Additionally, instruction was provided in the sessions on how to perform the goals, giving parents the opportunity to ask questions and understand how to more effectively meet their goals.

6.4.5.1.6 Self-monitoring of behaviour (2.3), Information about antecedent (4.2)

Parents were encouraged to monitor their children's snacking and sedentary behaviours and to think of all the social and environmental situations that predict the performance of the behaviours, as these BCTs inform knowledge shaping. Self-monitoring has been found to be associated with increased effectiveness among interventions targeting healthy eating (Bull et al., 2018). Therefore, it was included in the sessions through measures such as asking participants to keep a record of snacking and the situations or events that occur prior to snacks.

6.4.5.1.7 Social support (unspecified) (3.1)

The WhatsApp groups were included as an intervention component to inform social support. Social support (unspecified) has been shown to effectively promote healthy behaviours, such as physical activity and good dietary habits, in interventions targeting immigrant populations (Jagroep et al., 2022).

6.4.5.2 Overview of intervention content

The "Be healthy" programme was an online intervention which targeted refugee parents to support behaviour changes among their young children. Initially, this intervention was intended to be delivered face-to-face. However, due to the circumstances and restrictions associated with the COVID-19 pandemic, the mode of delivery was modified to enable the programme to be delivered in weekly sessions, online over Zoom. A rise in interest in online interventions has been evident in recent years, and it has increased by the COVID-19 pandemic (Fischer et al., 2020; Schleider et al., 2022; Shaygan et al., 2021). Online interventions with refugee population are considered promising and has the ability to enhance their accessibility to health services. This was supported by the literature, where there is a promising and encouraging literature regarding refugee populations' use of technologies (Burchert et al., 2019; Liem et al., 2021), which supports the World Health Organization's (WHO) plan to improve service accessibility for disadvantaged groups with digital and online methods (Jandoo, 2020; WHO, 2019).

The “Be healthy” intervention was a combination of these sessions and specially designed booklet. Over four weeks, participants had four hours of sessions and extra time to review the booklet during their own time. The intervention was delivered by the first author, who received training in motivational interviewing skills and clinical training by a practitioner health psychologist on how to facilitate group discussion. The intervention includes the following:

6.4.5.2.1 Booklet and sessions

The “Be healthy” booklet involved the application of several BCTs (5.1 Information about health consequences, 1.1. Goal setting (behaviour), 1.2 problem solving, and 4.1 instructions on how to perform the behaviour, 2.3 self- monitoring; 4.2 information about antecedent and Social support (unspecified) 3.1). The design and development of the booklet was based on the behavioural diagnosis and discussions with experts in behaviour change. In developing the booklet, we took into consideration the COM-B analysis in relation to barriers faced by refugee parents supporting behaviour changes among their children, with particular attention given to ensure the cultural sensitivity of materials. The booklet included information about the health consequences of the frequency of snacking, unhealthy snacks and sedentary behaviours, with the information tailored in accordance with the results of the COM-B analysis relating to parents’ needs.

The initial aim of the sessions was to support the use of the “Be healthy” booklet. However, in the delivery of the intervention, it seems it was an essential component of the intervention. The content of the sessions is described in the following table 6.4:

Table 6.4: "Be healthy" session content

Sessions	What was covered
Session 1	- Give an overview on the intervention. Provide introduction and instructions on how to use the booklet. - Provide information 5.1 about the health consequences of unhealthy snacking (the frequency and content). Give time to discuss and share personal experiences. - Discuss the concept of SMART goal setting, with a choice of (three options of goals that targeted snacking) 1.1 goal setting (Behaviour) to foster understanding and help families to set realistic goals. - Discussions and share within the groups to provide 4.1 instructions on how to perform the behaviour. - Finally, 1.4. Action planning by setting If-Then Plans.
Session 2	- Review parents' progress with the goals, then share with the group challenges and experiences (2.5, Monitoring outcome(s) of behaviour by others without feedback). - Educate parents on the appropriate number, proportion, ingredients, and timing of snacks (change 4 life materials used)(4.1 instructions on how to perform the behaviour). - Evaluate examples of healthy snacks from their culture and decide whether or not they should be considered healthy (change 4 life materials used). - Work together to choose a goal in relation to snacking 1.1 goal setting (Behaviour). - Advise parents to keep a record of snacking and the situations or events that occur prior to snacking (2.3 self-monitoring; 4.2 information about antecedent). - Finally, 1.4. Action planning by setting If-Then Plans.
Session 3	- Review parents' progress with the goals, then share with the group challenges and experiences (2.5, Monitoring outcome(s) of behaviour by others without feedback).

	- Educate parents regarding the definitions of sedentary behaviours, provide information 5.1 about the negative consequences of these behaviours (change 4 life materials used). - Encourage parents to identify barriers to reducing sedentary behaviours. Then, discuss ways that they could overcome these obstacles: e.g., reducing total video game time or encouraging the provision of active video games to reduce time spent seated while playing (problem solving 1.2). - Parents give examples and share experiences (problem solving 1.2). - Finally, 1.4. Action planning by setting If-Then Plans.
Session 4	- Review parents' progress with the goals, then share with the group challenges and experiences (2.5, Monitoring outcome(s) of behaviour by others without feedback). - Review all the goals and share with the group some of the challenges they faced and some of the suggested ways to overcome them.

6.4.5.2.2 Messages:

The use of text messages has proven to be effective for behaviour change approaches. It has been shown by a growing body of research in healthcare that frequent delivery of well-designed texts can enhance weight loss (Fjeldsoe et al., 2021; Patrick et al., 2009; Spark et al., 2015). Therefore, text messages were included in the intervention and they were sent out to all participants once every week. These messages included motivational quotes and a reminder of the following week's session with a link to the Zoom meeting.

6.4.5.2.3 WhatsApp:

It was clear from the behavioural diagnosis that the lack of social support has a significant impact on the levels of physical activity of their young children. Social support has been identified as an important element that can help refugees to feel more connected, enhance their sense of belonging, reduce the stress of discrimination, and facilitate their integration into their new societies (Stewart et al., 2014). In addition, social media, such as WhatsApp and Facebook, were more frequent methods of communication and information-seeking for refugees in a Syrian refugee camp than Skype, and emails (Shah et al., 2019; Xu & Maitland, 2016).

Therefore, these WhatsApp groups were included in this intervention to provide parents with the social opportunity to support their children's behaviour change. All the participants were assigned to a WhatsApp group which provided a secure space for them to share their experiences and challenges, as well as to motivate each other. These groups were facilitated by the researcher.

6.4.5.3 Mode of delivery

The mode of delivery was reviewed and refined based on the APEASE criteria evaluation (affordability, practicability, effectiveness, acceptability, side-effects and safety, and equity) , as summarised in Table 6.5. During the development stage, different viable modes of delivery were discussed. Initially, the face-to-face mode, delivered by bilingual health professionals such as social workers was the preferred option. However, this did not meet the APEASE criteria in terms of Practicability (not feasible due to the COVID 19 circumstances), and Acceptability (not safe due to the COVID 19 circumstances). Therefore, it was decided that the intervention would be delivered online via Zoom and be delivered by the researcher, which was deemed to be the most suitable approach in response to the emergent COVID 19 circumstances.

Table 6.5: The potential modes of intervention delivery

	Mode of delivery: Face- to- face / Group **Provider:** Bilingual health professionals such as dieticians or nurses, family support workers	**Mode of delivery:** Face- to- face / individual **Provider:** School teachers	**Mode of delivery:** Face- to- face / Group **Provider:** trained bilingual group of participating communities (Family health promoters) to deliver the intervention	**Mode of delivery:** Face- to- face / Group **Provider:** The researcher, train parents on how to use the booklet
Acceptability How far is it acceptable to all key stakeholders?	It could not be completely acceptable for all key stakeholders especially health professionals.	Not acceptable, teachers are so busy and they think it is not part of their role.	It is potentially acceptable.	It is acceptable for all key stakeholders
Practicability Can it be implemented as designed within the intended context, material and human resources?	Not within the constraints and resource of the feasibility study	Not within the constraints and resource of the feasibility study	It could be potentially implemented within the constraints and resource of the feasibility study.	It can be implemented within the constraints and resource of the feasibility study.
Effectiveness How effective and cost-effective is it in achieving desired	Based on the previous research and the nature of this population it is	it is highly effective, however it is	it is effective and costly effective	it is effective and costly effective

objectives in the target population?	highly effective, however it is not costly effective	not costly effective		
Affordability How far can it be afforded when delivered at the scale intended?	It was not affordable	It was not affordable	Affordable	It is affordable
Side-effects How far does it lead to unintended adverse or beneficial outcomes?	It has potential to be beneficial and give favourable outcomes	It has potential to be beneficial and give favourable outcomes	It has potential to be beneficial and give favourable outcomes	It has potential to be beneficial and give favourable outcomes
Equity How far does it increase or decrease differences between advantaged and disadvantaged sectors of society?	It has potential to decrease the differences	It has potential to increase the differences	It has potential to decrease the differences	It has potential to decrease the differences

6.5 Discussion

This paper is the first to report the development of the intervention targeting health behaviours among refugee families following the behaviour change wheel. This intervention was responsive to the global call of action to prevent childhood obesity (Davis et al., 2007; Niehoff, 2009). This paper provided a detailed presentation of the steps taken to develop and refine the "Be healthy" intervention, which is the first intervention tailored in a culturally sensitive way to tackle the specific issues that hinder refugee parents from supporting the behaviour changes for their young children. In order to improve the health behaviours of refugee children, we have identified needs to target parental capabilities and opportunities with the "Be healthy" intervention. The results from the COM-B analysis found that in order to achieve this aim of

empowering parents to improve their children's health behaviour, changes were required within psychological capability, physical opportunity, and social opportunity. As a result, we have developed an intervention that consists of a booklet, sessions, messages and WhatsApp groups with the aim to reduce unhealthy snacking and sedentary behaviours among young children from refugee families. The content of this intervention was based on evidence and the specific needs of this population.

From the existing literature, our systematic review and qualitative study findings, we have identified that refugee parents faced barriers that affected their children behaviour change, including a lack of knowledge, time, cost and social support. In addition, we have found the importance of language, literacy, cultural sensitivity considerations in designing an intervention for this population. In developing the "Be healthy" intervention, attention was therefore focused on tackling these elements. As a result, all of the intervention components included behaviour change techniques to support behaviour changes, including 5.1 Information about health consequences, 1.1. Goal setting (behaviour), 1.2 problem solving, and 4.1 instructions on how to perform the behaviour, 2.3 self- monitoring; 4.2 information about antecedent and Social support (unspecified) 3.1.

While some of the themes identified in the COM-B analysis were also identified in the thematic analysis of parents' perspectives and experiences regarding their children's behaviour changes, framing the themes following the COM-B and linking them to the TDF framework gave the analysis an additional dimension of depth and took the analysis further towards developing the intervention in a more systematic and deductive way.

6.5.1 Strengths and limitations of the study

There are key strengths of this study that contribute to existing knowledge. First, it is the first report of the development of an intervention using the behaviour change wheel and targeting unhealthy snacking and sedentary behaviours among refugee families with young children. . It was strengthened through PPI involvement during each stage of intervention development, as their involvement aided the decision-making process and ensured the application of all applicable cultural sensitivity considerations(Brainard et al., 2017; Warner et al., 2021). Additionally, PPI involvement had the potential to speed up the implementation of the final intervention, since they were involved throughout. On the other hand, it is possible that this study is limited by the fact that using BCW requires a comparatively lengthy process, which

makes it prohibitively time consuming to identify the needs of a population, develop the bespoke intervention, and finally implement it (Casey et al., 2019). Although, this process was long, however, the evidence gathered during the design of this intervention contributes to a growing body of evidence about barriers to behaviour change in this population.

Chapter 7. Acceptability study of a tailored intervention to reduce snacking and sedentary behaviour in young children of refugee parents

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7.1 Abstract

Objective:

One of the greatest challenges facing health care systems and governments today is childhood obesity. This is particularly prevalent among children who settle in developed countries as refugees. As a result of the marked changes in their environment, refugees commonly experience changes in their health behaviours, such as levels of sedentary behaviour and altered eating patterns. "Be healthy" was developed to address a gap in the literature and key issues facing parents with their young children, such as the trend towards more sedentary behaviour and increased consumption of unhealthy snacks. This programme is a culturally and linguistically appropriate family-based intervention designed for refugee parents with young children resettled in the UK. Using the Theoretical Framework of Acceptability (TFA), this study assessed the acceptability of the intervention and examined its utility for assessing acceptability.

Methods:

Following a four-week intervention period, semi-structured interviews were conducted with 23 parents recruited from local refugee organisations in the North West of England. Deductive framework analysis was used to analyse transcripts using the seven constructs outlined in the TFA.

Results: Six of the seven TFA constructs were present within the data: affective attitude, burden, intervention coherence, perceived effectiveness, ethicality, and self-efficacy. No data were found in terms of opportunity costs. Participants reported a positive attitude towards attending the intervention, perceiving it as being effective in motivating and initiating behaviour change. "Be healthy" was deemed acceptable, as overall it was reported as well liked, simple to use and easy to understand. The novel findings of this study include the

perceptions of participants on the intervention design, namely that it was informed by many cultural considerations and therefore fits well with their cultural norms and value system.

Conclusion:

The "Be healthy" intervention is acceptable to refugee parents of young children. In addition, the TFA is a useful model in guiding qualitative analysis, although its utility could be improved in future acceptability studies by using the framework during early research design. Future research could refine the intervention by streamlining the referral process, by providing visual support for less literate participants, such as adding more photos to the booklet, and by considering the organisation of groups based on their nationalities. Future research should focus on establish the efficacy of the intervention in facilitating improved health behaviours in refugee families.

7.2 Background:

Childhood obesity constitutes one of the most serious public health challenges for governments in the 21st century(WHO, 2018b), particularly for refugee children who settle in developed countries (Baauw et al., 2019). According to a recent review, obesity rates among refugee children settled in developed countries increased from 9% - 17% at arrival to 21% - 35% after settlement(Kumar et al., 2021). Globally, the numbers of refugees are on the rise, posing a particularly significant challenge to the governments of host countries, especially given that these vulnerable populations face many challenges that can undermine their health. As an example of this, the dramatic changes in their environment often result in refugee populations experiencing changes in their health behaviours, such as their eating patterns and levels of physical activity (Gichunge et al., 2016; Renzaho & Burns, 2006; Vue et al., 2011). The health behaviours of most concern to parents of young refugee children, after they have settled, are increased sedentary behaviour (i.e., activities that are performed sitting or lying down) and greater consumption of unhealthy snacks (Alsubhi et al., 2022).

Childhood obesity is especially prevalent in refugee populations who have settled in developed countries (Grijalva-Eternod et al., 2012a; Kearns & Woodland, 2019; Murphy et al., 2017). Refugee populations often

experience changes in dietary patterns and levels of physical activity after resettlement, which can lead to greater body size and increased cardiovascular disease risk (Gichunge et al., 2016; Renzaho & Burns, 2006; Vue et al., 2011). Marked changes in their environment can particularly influence the diet and level of activity of their young children (Alsubhi et al., 2020). Acculturation, which refers to the cultural and psychological changes that occur as a result of two different cultures coming into contact with each other(Berry, 1997), has a powerful impact on the health behaviours of refugees resettled in developed countries. The literature showed a clear association between acculturation and the dietary behaviours and other obesity-related behaviours of refugee families(Alsubhi et al., 2020). Additionally, acculturative stress is another plausible factor that influences the development of obesity in refugee populations through acculturation. Acculturative stress is defined as " *a reduction in health status (including psychological, somatic and social aspects) of individuals who are undergoing acculturation, and for which there is evidence that these health phenomena are related systematically to acculturation phenomena*"(Berry et al., 1987, p. 491). It has been suggested that acculturative stress might have an effect on the development of obesity through coping behaviours, such as eating habits. This was supported by a recent study that found that acculturation stress appeared to be a risk factor associated with anxiety, emotional eating, and restrained eating (Hun et al., 2021). Several additional influences on obesity have been found in recent systematic reviews of studies on refugees after resettlement in developed countries (Alsubhi et al., 2020). Lack of food literacy, increased availability of unhealthy foods, and reduced availability of nutritious foods are associated with unhealthy food choices(Alsubhi et al., 2020). According to Alsubhi et al. (2020), there was a tendency for overconsumption of food among refugee families due to incentives from increased food variety and abundance compared with their home countries. Poor weather limited activities, laboursaving devices reduced domestic activity, and sporting activities were not valued, these were among the factors that influenced activity directly(Alsubhi et al., 2020).

Recent qualitative research has revealed that the health behaviours typically of most concern to parents of young refugee children are increased sedentary behaviour and greater consumption of unhealthy snacks (Alsubhi et al., 2022). This may be associated with the fact that refugee families have a higher likelihood of being overweight and developing obesity, potentially contributing to the health inequality gap (Delavari et al., 2013; Murphy et al., 2017; Naigaga et al., 2018). Recent qualitative research has revealed that the health behaviours of most concern to parents of young refugee children are increased sedentary behaviour and greater consumption of unhealthy snacks (Alsubhi et al., 2022). This suggests that there is a need for, and desire to

take up, interventions that specifically tackle these factors and potentially enable the curtailment or prevention of childhood obesity.

Parents play an important role in shaping the experiences of their children regarding food and sedentary behaviour. This influence includes the overall development of the diet, eating habits and food preferences(Walsh et al., 2015), with most excess weight prior to entering puberty being gained before five years of age (Gardner et al., 2009; Hui et al., 2008; Monteiro & Victora, 2005; Ong & Loos, 2006). This is especially important given that the early environment has been recognised as exerting a powerful, long-lasting effect on the development of obesity (Anzman et al., 2010). Reviews have shown that parental involvement is of crucial importance if interventions targeting childhood obesity are to result in successful weight loss (Berge & Everts, 2011) and a reduction in sedentary behaviour (Downing et al., 2018). Interventions that treat the whole family as a unit are particularly important for engaging refugee and immigrant populations (Wieland et al., 2018). Additionally, there is emerging evidence to suggest that the success of family-based obesity prevention and treatment programmes is greater when the focus is on training parents and maximising their involvement and influence at the household level; and when parents were the exclusive agents of change the results were superior to the conventional approach (Renzaho et al., 2015a; Young et al., 2007). Many treatment guidelines for childhood obesity also recommend family-based interventions, based on the notion that these approaches can improve the health of both parents and their children (Ostbye et al., 2012).

The design of effective interventions targeting refugee families requires the consideration of two important aspects, namely sufficient understanding of the targeted population and the selection of the most appropriate approach that enhances the engagement and effectiveness of the intervention. Designing culturally and linguistically appropriate interventions is associated with greater success in programmes that target racial and ethnic disparities. Without cultural and linguistic tailoring based on a deep understanding of the target population, interventions are likely to be limited in acceptability and effectiveness. As well as wasting resources, this can heighten distrust among the target population towards any future research involvement, thereby diminishing the possibility of sustaining promising interventions in community settings (Abelson, 1997; Boote et al., 2002). Oversight in this area risks the implementation of interventions that do not work well, ultimately heightening the distrust of the target population towards any future research involvement and lessening the possibility of sustaining promising interventions in community settings (Abelson, 1997; Boote

et al., 2002). According to Cooper et al., (2002),cultural tailoring and appropriateness have been critical to the success of some interventions (Cooper et al., 2002; Freeborn et al., 1978; McAvoy & Raza, 1991; Resnicow et al., 1997). For example, using culturally and linguistically appropriate written and audio-visual educational materials is often associated with more successful outcomes, such as higher quit rates for African-American smokers and increased usage of preventive services, such as cervical cancer screening, among Asian women in the United Kingdom (Orleans et al., 1998). Studies in the US health-care system have also shown that the use of interventions that are culturally appropriate and acceptable to a target population can reduce health disparities (Cooper et al., 2002).

Together this highlights the need for interventions targeting these behaviours in this population to be culturally and linguistically appropriate and to include families. This was confirmed by a recent review that highlighted the need for family-based and culturally appropriate interventions for children from ethnic minority groups(Wang et al., 2022). In an attempt to cover the gap in the literature and address some of the issues parents face with their young children, the "Be healthy" programme was developed. This is a family-based intervention that was designed to provide culturally and linguistically appropriate support to refugee parents with young children resettled in the UK. This intervention was designed based on the principles of the Behaviour Change Wheel (Michie et al., 2014) and also informed by qualitative research into the factors associated with obesity-related health behaviours among child refugees following their resettlement in developed countries (Alsubhi et al., 2020).

It has become increasingly important to consider acceptability in the design, evaluation and implementation of interventions, to improve intervention fidelity and effectiveness (Sekhon et al., 2017) (Diepeveen et al., 2013). Acceptability refers to the cognitive and emotional reaction to an intervention, which is a fundamentally important element in determining its success (Sekhon et al., 2017). This stage is important also to understand how an intervention can be best delivered (e.g., structure, duration, location, training), and made most acceptable to those who will use it (e.g., service users, parents) (Group, 2002). The level of perceived appropriateness of an intervention is as an indicator that the intervention is appropriate for implementation with the target population. While many studies have evaluated the acceptability of interventions, the descriptions of how acceptability has been defined or measured are lacking or inconsistent. In response to this issue, Sekhon and colleagues developed the theoretical framework of acceptability (TFA), which consists of

seven constructs: affective attitude (feelings about participating in an intervention, as well as feelings about the intervention), burden (effort required to participate in the intervention), perceived effectiveness (perceived likelihood for the intervention to achieve its intended purpose), ethicality (fit with their value system), intervention coherence (understanding the intervention and how it works), opportunity costs (what must be given up to engage in an intervention), and self-efficacy (confidence that the behaviours required to participate in the intervention can be performed)(Sekhon et al., 2017). Since the TFA is a relatively new framework, there is still need to evaluate and demonstrate the validity as well as appropriateness of its utility across populations. In this study, the framework was used to assess the acceptability of the intervention in the target population.

This paper had two main aims: firstly, to determine the acceptability of the "Be healthy" intervention (Appendix A) to refugee parents, in order to further refine and finalise the intervention; and, secondly, considering the utility of the TFA, in evaluating the acceptability of the intervention.

7.3 Methods:

7.3.1 Design:

This acceptability study used a qualitative approach to assess the acceptability of the "Be healthy" intervention for parents. Qualitative methods can be used in the early stages of development on an intervention, as well as during the final stages, when assessing acceptability, providing critical insights into its effectiveness (Ayala & Elder, 2011) and enhancing data richness (Bhatti et al., 2021).

7.3.2 Setting:

The programme was designed and implemented in a city in the North West of England. This was a family-based intervention that targeted refugee parents, with the aim of increasing their knowledge and self-efficacy, motivating them to reduce the sedentary behaviours and unhealthy snacking exhibited by their children through a combination of education, persuasion and enablement functions to promote behaviour change among this population.

The “Be healthy” intervention is aimed at refugee parents with children aged 2-10 years and was designed to run for approximately four hours over four weeks. The intervention comprised an online Zoom meeting (group discussion) every week, supplemented with SMS text messages sent as reminders to participants, a WhatsApp group to motivate parents, and a booklet that provided goal setting and culturally appropriate health information. The intervention was delivered online within a refugee support network situated in the UK.

7.3.3 Intervention Description:

The “Be healthy” programme was developed in accordance with the principles of the Behaviour Change Wheel(Michie et al., 2014). The intervention comprised three core components (see Figure 7.1):

Figure 7.1 The “Be healthy” three core components

The “Be healthy” booklet was written and designed to help refugee parents to support behaviour changes in their young children and therefore targeted two health behaviours that were identified from the behavioural diagnosis(Michie et al., 2011). The intervention included weekly sessions on Zoom, a WhatsApp group, SMS text messages and a booklet, which outlined a set of behaviour change techniques (BCTs) (5.1 information about health consequences, 1.1. goal setting (behaviour), 1.2 problem solving, and 4.1 instructions on how to perform the behaviour, 2.3 self- monitoring; 4.2 information about antecedent and social support (unspecified) 3.1). The weekly sessions provided support in using the “Be healthy” booklet, in addition to the application of selected BCTs, such as: (2.5, Monitoring outcome (s) of behaviour by others without feedback, 4.1 instructions on how to perform the behaviour, problem solving 1.2). These BCTs were incorporated into the booklet and used within the sessions. These were translated into participants’ native language and the lead researcher used real life examples to reach the accurate meanings. During the week, participants were encouraged to share their experiences and achievements in the WhatsApp group. Before each session, participants would be sent a text message reminder (see Appendix B).

7.3.4 Participants:

Refugee parents (N=23) were recruited to take part in the intervention. Participants were all mothers and came from Syria, Sudan or Nigeria. Their characteristics can be seen in Table 7.1. Participants were recruited from two refugee organisations operating in the North West of the UK. Under the selection criteria, eligible participants were refugee parents (mothers and fathers) of young children (aged 2-10), who had been resettled in the UK for three years or longer. After completion of the intervention, twenty-two participants (96%) agreed to take part in an individual semi-structured interview. These were primarily were conducted in Arabic, with one in English.

7.3.5 Procedure:

Participants were recruited by the first author (MA). Interested parents were given a participant information sheet and asked to provide informed consent before receiving the intervention (See PIS Appendix). The "Be healthy" intervention was delivered by the first author online via Zoom, in collaboration with a refugee organisation (See the booklet Appendix B). The first author was trained to deliver the intervention, as a bilingual (Arabic and English) doctoral-level trained psychology researcher with expertise in delivering behaviour change techniques. Specific intervention training involved approximately 200 hours of self-learning on group facilitation and the principles and practice of motivational interviewing, combined with understanding the principles and application of motivational interviewing (MI) within the sessions, as well as reflexive clinical supervision and continued clinical supervision from a practitioner health psychologist for the duration of the programme. The post-intervention interviews were also conducted by the first author. Participants were sent the booklet for review, one week prior to their first Zoom meeting. They were asked to provide their details for the WhatsApp Group and text message reminders were sent to each participant before every zoom session. After the four week intervention, each participant was invited to join an interview over Zoom.

7.3.6 Data Collection and Analysis:

Data collection consisted of post-intervention semi-structured interviews that were conducted by the first author. After completing the intervention, participants were interviewed, following a topic guide (See Appendix) that was developed based on the acceptability framework (Sekhon et al., 2017). This guide included questions on the TFA constructs, affective attitude, burden, perceived effectiveness, ethicality, intervention coherence, opportunity costs, and self-efficacy.

All interviews were conducted in Arabic and the data from the interviews were audio-recorded with the consent of participants, after which they were transcribed verbatim directly to English by the lead author. For the purposes of ensuring translation quality assurance, a professional translator conducted a comprehensive, independent cross-check (Lincoln & Gonzalez y Gonzalez, 2008; Squires, 2008; Wong & Poon, 2010).

The concepts of acceptability are considered complex, interrelated phenomena and therefore qualitative methodologies were used to ensure effective evaluation, as well as to provide a rich, contextualised understanding of the acceptability of the intervention (Moore et al., 2015). Acceptability refers to the cognitive and emotional reaction to an intervention, which is a fundamentally important element in determining its success. The level of perceived appropriateness of the intervention is considered as a reliable indicator of the participants' intention to engage with the programme. Therefore, using a framework analysis, the findings were analysed deductively based on each TFA construct (Ritchie & Spencer, 2002). The qualitative data generated from the interviews were then coded using the acceptability framework (Sekhon et al., 2017). The TFA consists of seven constructs (see Figure 7.2).

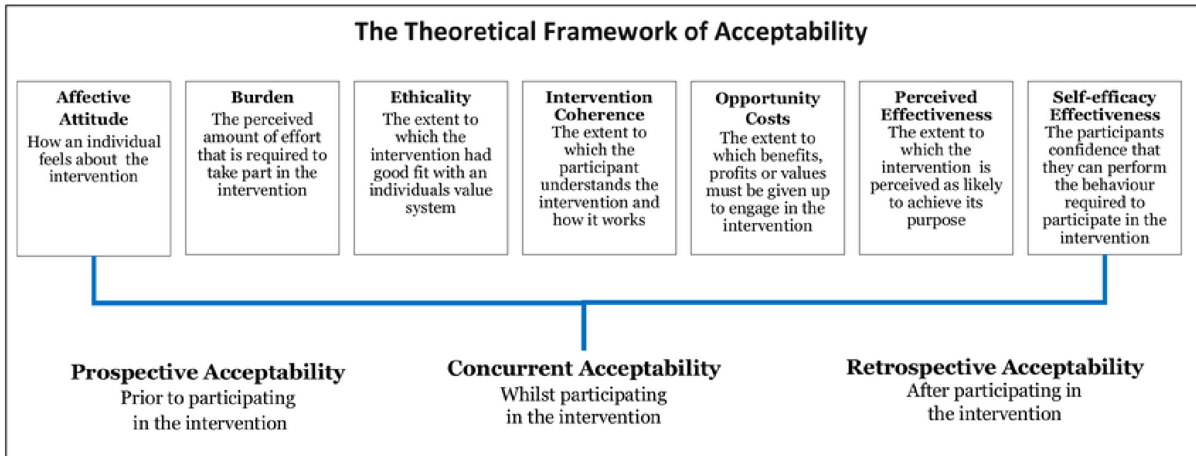

Figure7.2: The theoretical framework of acceptability developed by (Sekhon et al., 2017)

Another key concept in qualitative research is establishing the trustworthiness of the analysis, which describes convincing the wider audience that the research findings are worthy of attention(Lincoln & Guba, 1985). One of the most widely accepted and easily recognised means of ensuring trustworthiness is the criteria of credibility, transferability, dependability, and confirmability(Nowell et al., 2017). In an attempt to ensure that the analysis was conducted in a rigorous and methodical manner to yield meaningful and useful results, within the analysis stage the lead researcher shred codebook with the wider research team in order to develop a consensus that the data is represented authentically within the coding and themes (Nowell et al., 2017). As part of the analysis, initial codes were shared with other researchers in the team, who met regularly to discuss and refine the coding and thematic framework.

7.3.7 Ethics:

Ethical approval was granted by a university research ethics committee (Ref: 2021-11711-20519).

7.4 Results:

Twenty-three individuals consented to take part in the intervention and qualitative acceptability interview. See Table 7.1 for demographic information on the sample

Table7.1: Socio-demographic characteristics of participants (N=23)

Country of origin	N	Age in years **Mean +(SD)**	Years lived in the uk **Mean + (SD)**	Native language	Education level
Syria	12	32. 5 (8. 5)	4. 75±1. 48	Arabic	**Primary or less** 33% **Some high school** 33% **University degree** 33%
Sudan	9	30. 1±7. 0	5. 66±1. 80	Arabic	**Primary or less** 22% **Some high school** 55% **University degree** 22%
Nigeria	1	42	6	Yoruba	**Postgrad**
Kuwait	1	38	8	Arabic	**Some high school**

Themes:

Intervention Acceptability

From the qualitative data, evidence has been identified relating to six out of the seven of the TFA constructs (affective attitude, burden, intervention coherence, perceived effectiveness, ethicality and self-efficacy). However, data were not identified in relation to opportunity costs, which may be attributable to a conflict reflected in the data between the meaning of opportunity cost and burden. After discussion between the research team, it was agreed that burden was more suitable in this research context.

Affective attitude

This construct concerns how an individual feels about an intervention and therefore captures how refugee mothers felt when they attended the "Be healthy" sessions. In general, most mothers reported that they had a positive perception of the intervention, expressing feelings of excitement associated with attending the sessions.

> "*The sessions were very helpful, and I was feeling excited, and each session gave more energy every week (P.18)"*

These feelings of excitement were explained by the participants as resulting from their previous experience in receiving significant family support in their home country, where they were able to rely on their mothers and other family member for advice regarding their children's diet and physical activity. Several participants stated their perception that the "Be healthy" intervention somewhat filled that gap.

> "*I felt excited, especially as, here in the UK, I do not have family who I can ask for advice regarding my kids. I have also never attended something like that (P.5)."*

They explained that the feeling was attributable to having a trusted person or place from which they could receive advice about the healthy lifestyle behaviours of their children. These mothers felt that it was not only important to have a place of people that fill a gap in their lives and provide necessary advice, but it was especially important that this be a trusted source. For example, one of the mothers highlighted this by saying:

> *"I was happy to listen to it [advice] from someone who is well-educated in this field, as I do not like reading (P.2)."*

The "Be healthy" sessions were perceived as enjoyable to most of the participants. For example, this mother described her feeling attending the sessions:

> *"Honestly, I benefitted from it, and I enjoyed the programme, even though it only ran for four weeks (P.13)."*

Some participants also mentioned that this was the first time that they had attended anything like the sessions and they had enjoyed the experience, thus indicating affective attitude towards the intervention and that a group of mothers whose voices had been missing from research had been successfully reached.

> *"For me, it was the first time that I've attended something like that, and I liked when we discussed things as mothers and shared our experiences. Yes, the discussion was my favourite part (P.4)."*

Some of the participants highlighted the importance of feeling safe and not being judged in attending the "Be healthy" programme, potentially reflecting the need for a certain level of understanding regarding the situation of refugee families. They shared a tendency to feel extremely disempowered in their new settings, because they do not know the language or how to integrate into their new communities. Therefore, attending the "Be healthy" intervention was perceived by these mothers as a source of social support:

> *"I think I have benefit from your programme, because of the feelings of being accepted and not being judged based on our background (P.9)."*

On the other hand, expectations played a key role in forming the attitudes of participants towards the intervention. When some families were invited to participate, they had different expectations of the experience, which may have affected their attitude towards the whole process. This could include both negative and positive impacts on their attitudes. For example, a participant explained how she felt that the interventions were useful, but that the programme was not at the level that she had expected:

> *"The information in the session was very useful, but for me, I was looking forward to having a piece of high-level information where this could be amazing as I am aware of the information you already shared with us, and it could be constructive for others (P.7)."*

However, some participants discussed their feelings of worry and nervousness before attending the intervention, as they expected it would be difficult and demanding, which impacted their feelings towards the programme. For example, one mother shared how she felt before attending:

"In the beginning Mrs X talked to me about the programme, so, honestly, at the beginning, I felt nervous and worried, since I am so busy and thought that you would ask us to do lots of things. But when I contacted you and read the PIS, I felt differently—I felt motivated (P.21)."

The comments by other participants regarding their feelings before attending the programme highlights the importance of managing the expectations of participants:

"Honestly, I was afraid at the beginning, because I was worried that I would not give a good impression of my parenting style. I understand that there is no such thing as a perfect parent, but I was worried about the image that I would give of refugee mothers and their parenting. However, after the first sessions I felt much better; I felt that it was a good environment and that we were all working together to be better. Also, when you shared your personal experience, it made me really comfortable (P.3)"

This reflects issues in the referral process, especially when using stakeholders to identify potential participants, which suggests the need to improve this process by providing more information and making the level of the intervention clearer for prospective participants.

Perceived Effectiveness

This construct is looking at the extent to which the "Be healthy" intervention is perceived to be likely to achieve its purpose. When asked about the usefulness of the programme content in motivating and initiating change towards the reduction of snacking, mothers referred to the session activities as interesting and helpful in changing their views, using BCTs to reduce snacking and learning from others in the group, suggesting they perceived it to have been, or potentially to be, effective. For example, one mother explained how she learned ways to start making meaningful changes:

"*I realised that there were some issues with my kids snacking, for example, but did not know what to do and how I could start the change. So, for me, the sessions were really great. I felt really motivated to start making changes. Not only that, but I learned how to make those changes (P.10)."*

Some of the participants indicated their perceived effectiveness of the intervention by describing the impact of their attendance on their children's snacking behaviour and explaining the steps that they had taken in achieving their goals.

> "*Snacking, especially sweets and juices, was a big issue for me with my daughters, so yes of course I set a goal to reduce the amount of sweets and juice and replace them with healthy snacks. The best thing was that I learned how to make changes step by step, like you told us. Since then, I have noticed that they [my children] accepted fruit and the other alternatives we shared in the sessions as replacements for the sweets. I was surprised how they accepted that (P.4).*"

Reducing time spent in sedentary behaviours was one of the most challenging goals for the participating mothers. However, they highlighted that attending the "Be healthy" course had motivated them to initiate a change in this area. For example, this mother explained her experience with starting the change:

> *"Another important goal was decreasing sedentary behaviours, especially decreasing the time spent watching TV. So, I set a goal and worked so hard and I can see improvement and I am so happy about that (P.8)."*

Other participants indicated perceived effectiveness by describing how the strategies used in the intervention had an impact not only on the behaviours targeted in the intervention, but also in providing new skills that were also applicable in other aspects of their lives.

> *"I have set goals regarding my kids snacking, which is decreasing the amount of unhealthy snacks and by the end of the programme I saw lots of improvement. Also, I have learned something for me, in my personal life, which is that I can do anything I want, especially if I set clear goals and work towards achieving them step by step. I just need to believe in myself (P.21)."*

Other aspects of the "Be healthy" intervention were also perceived as being effective in increasing motivation and initiating behaviour change. Social support was a particularly important area, with mothers commenting on how attending the sessions had helped them to feel more socially connected to other women in the same situation as them and that they highly appreciated the level of sharing and acceptance.

"I liked it a lot, because I felt like I connected with the other moms during the week. It was a good space for us to share our experiences and ask about ideas (P.8)."

Another mother explained the importance of the sense of belonging by describing her feelings when she attended the sessions:

"Actually, it was great for me, especially the feeling that you are not the only one that suffers from these issues with your kids. There are other mothers like me (P.12)."

The concept of sharing during the sessions was also highly valued by participants. One mother explained that sharing challenges was not only beneficial in creating a sense of not being alone, but they were also sharing ideas and solutions that could provide ways to overcome these barriers.

"*The sessions were great for me, especially sharing the information and experiences. For me, I learned a lot from the other mothers. I realised that there were some issues with my kids snacking, for example, but did not know what to do and how I could start the change. So, for me, the sessions were really great. I felt really motivated to start making changes. Not only that, but I learned how to make those changes (P.10)."*

That level of social connection and sharing could indicate perceived effectiveness.

"I really liked that we were able to participate and share, not only listening to you. Especially the part when we reflected on our progress in the previous week. I really liked that part and benefitted from others moms' experiences (P.9)."

On the other hand, a small number of the mothers did not value that level of sharing challenges and negative experiences, instead explaining that they would have appreciated having discussions around solutions and providing positive examples, rather than spending time discussing negative experiences, which they disliked.

"Honestly, I did not benefit from the experiences and the discussion. I felt that I was the only one who did not suffer from the things others were talking about. It is okay, I can listen to their experiences, but at the same time, I want to exchange and share positive experiences. You know what I mean. I

want to have good examples, too, with others telling us the good things they have done and how they did it. Because, for me, I want to improve (P.20).”

Most of the participants perceived that the level of information provided in the sessions was suitable for them.

“To me, the level of the information was right, because if you spoke about complex and high level information that I do not understand, I wouldn’t listen or ask questions, so I wouldn’t have benefitted. But the information in the programme was really easy to understand and I wanted more information, especially about sedentary behaviours (P.3).”

The intervention also provided information through the “Be healthy” booklet and in the discussions in the WhatsApp groups. Generally, the participants perceived the level of the information provided to be suitable and effective. For example, this mother explained how she found the booklet easy to read and appropriate for her as a mother:

“*The size of the booklet was appropriate for me as a mother. It was easy and readable, as some of the mothers do not read or have difficulties in reading (P.15).”*

Although the “Be healthy” intervention was perceived as effective by the majority of mothers, with the sessions being cited as particularly beneficial, a few participants nevertheless commented that the level of information provided was basic and that they would have preferred a higher level of information.

“There is a point where I can say that we must have more specialised information from scientific and medical perspectives, rather than basic information (P.7).”

On the other hand, a group of the mothers reflected some level of difficulty with health literacy. For example, one mother shared her preference for attending the sessions, rather than reading the discussions and information provided in the booklet and WhatsApp group.

“Personally, I did not benefit from the information in the WhatsApp group. As I told you, I am not educated, so sometimes I did not understand what they are saying. I prefer to have voice notes and videos and pictures. For me, my son helped me download Zoom to attend (P.5).”

These mothers expressed a strong preference for receiving information through verbal and visual forms, rather than in a written format.

> *"It was good for me, especially as I am not highly educated, so it was easy for me to understand. I especially liked the photos and when you shared some of the activities on the slides within the sessions (P.4)."*

These mothers reflected hard-to-reach, hidden, and vulnerable populations in research, making their insights valuable. Generally, they perceived the intervention as highly effective, enabling them to overcome some of the identified barriers. This reflected the importance of education level as an influential factor that affected the engagement of participants in the intervention. Some felt anxious and experienced difficulties in engaging and sharing in the sessions, while others felt that the intervention was too basic and would have preferred the provision of more, or more sophisticated, information.

Intervention Coherence

Intervention coherence captures the extent to which the mothers recognised and understood the aim and function of the "Be healthy" intervention and that it made sense to them. This construct is closely related to self-efficacy, with self-efficacy focused more on the participants' confidence that they are able to perform the behaviours required to participate in the intervention. This inter-relatedness is not always the case, but does seem to be for the sample of refugee mothers in this intervention. There are two sub-themes under this theme, namely that intervention content was perceived as relevant, valuable and cultural considerations.

Participants explicitly stated clear understanding of the aims of the intervention by explaining how they followed them:

> *"I understood that every week would focus on one goal and you gave us strategies that helped us to achieve the goal. What I liked the most about the programme was that it was easy and you shared with us step by step how to initiate change. This part was really valuable for me. For me, by the end of the programme, looking back at the goals I have set for my kids, I can see that I have achieved a lot (P.21)."*

Intervention content was perceived as relevant, valuable

A number of aspects indicated the coherence of the "Be healthy" intervention. One of these was that targeted behaviours were perceived as relevant and valuable to the situation experienced by the refugee families during the post-resettlement phase. Many mothers explained that the issues of snacking and sedentary behaviours were highly relevant to their children:

> "*Snacking, especially sweet and juices, was a big issue for me with my daughters, so yes of course I set a goal to reduce the amount of sweets and juices and replace them with healthy snacks (P.4)."*

Several participants also highlighted the importance of the clarity and simplicity of the "Be healthy" intervention. For example, one mother explicitly stated that she found having simple strategies to be very important to her, given the challenges that she faces in dealing with her children.

> *"I really liked setting goals, because it was so simple and not that complicated, especially looking at the goal and trying to think whether it is specific, timely and realistic. This was very important for me, since dealing with kids can be difficult and challenging, so it is very important to have these simple strategies that we can use (P.9)."*

Other participants highlighted the impact of flexibility in following the strategies used in the intervention. For example, regarding goal setting, one mother explained how she appreciated the opportunity to set her own goals that related specifically to her children.

> *"But at the same time, you give us an opportunity to choose our own goals, as you know in the third week, I set a personal goal and it was not from the suggested goals and that was great to have that opportunity… But of course, as you said, that it is related to snacking or diet in general (P.10)."*

Cultural considerations

Another aspect that indicated the coherence of the intervention is the recognition given to cultural considerations and whether or not this was apparent in the course design. These considerations included the use of Arabic language, which many mothers explicitly stated as being something that they perceived as culturally appropriate.

"One of the things that made me join the programme was the fact that it was in Arabic. As I mentioned, I am not very well educated, so it is very important for me to understand. Although I have been here for a long time, I cannot understand English at all (P.5)."

In addition to the use of Arabic in the delivery of the sessions, ensuring that the booklet was linguistically accessible to all course participants was also perceived by many of the mothers as being vitally important. In other words, making the supplementary written text clear and easy to understand was perceived as reflecting a level of cultural sensitivity.

"The size of the booklet was appropriate for me as a mother. It was easy and readable, as some of the mothers do not read or have difficulties in reading (P.15)."

By describing their perception of the examples used in the intervention, other mothers explained how they felt that the "Be healthy" initiative was designed in a way that was respectful to their culture.

"I really liked the suggested goals and examples: they were acceptable, especially because you gave some examples that are suitable for our culture and most importantly for me. They were easy to follow and reflect our busy lives here in the UK (P.11)."

On the other hand, some mothers reported that "Be healthy" could be modified further to make the programme even more accessible, especially to individuals at different levels of health literacy. One of these suggestions is the use of more photos in the booklet, which may be an effective strategy to overcome some health literacy barriers.

"The information was clear and easy to understand… but, as I said, maybe we could add more information with pictures (P.12)."

Another suggestion was to organise groups around nationality, although there were differences of opinion regarding the benefits of being in a group where all participants come from the same nationality or culture. The majority of mothers felt that being in mixed-nationality groups was effective, as it offered greater heterogeneity and that this was inherently valuable.

"I think I would prefer to have different nationalities within the same group, so we can learn more about their cultures, food system recipes, etc. Maybe they are healthier than us, so we can be motivated and follow them. I think we would beneficial more if we integrated into another mixed nationalities group to learn more about how they eat and their food system (P.17)."

However, other mothers felt that it was important for them to be in groups with mothers from the same origin country as themselves, as they perceived that similarities in culture and experience would be beneficial.

"For me, I prefer to have mothers from the same culture and same country. Because we have the same lifestyle and food system so we can relate much better (P.12)."

These suggestions are important in the process of improving the intervention for future use.

Self-efficacy

This construct denotes the level of confidence expressed by participants regarding their ability to perform the behaviours required to participate in the "Be healthy" intervention. This construct is closely related to intervention coherence, with mothers describing how attending the intervention helped them to feel more comfortable in initiating targeted behavioural changes.

Many of the mothers highlighted particular elements in the design of the "Be healthy" intervention that affected their confidence levels. One of these aspects was the level of authenticity, relevance and realism of the suggested goals and examples, which gave the mothers confidence that they would be able to perform the required behaviour. For example, one mother shared how she felt that attending the "Be healthy" intervention had boosted her confidence in initiating and making changes to her behaviour, because the intervention used easy and relevant examples.

"The examples were good and made it easy for us to understand the ideas and to set our own goals related to snacking or sedentary behaviours (P.11)."

Some participants also explained that their attendance at the sessions had helped them to feel more confident in not only initiating new behaviour, but also in achieving their goals:

> *"I wanted to work on my son's snacking, so my goal was to decrease the amount of sweets and juice he has each day. By the end of the programme, I noticed definite improvement: he is eating more fruit and drinking flavoured water like (Zahra) suggested in the WhatsApp group (P.3)."*

Another important element was the simplicity of the BCTs that were used in the intervention (e. g., goal setting, problem solving and action planning) and how these affected the confidence the mothers felt towards being able to achieve the required changes. Participants explained how the strategies felt achievable, as well as the ways in which their own expectations prior to the commencement of the intervention had positively impacted on their self-efficacy.

> *"Setting goals was a very good strategy. I think it is simple and powerful at the same time, so I think I will use it in the future (P.20)."*

Some participants explicitly stated that their confidence had changed as a result of attending the intervention. For example, one mother explained how she felt at the beginning and after attending the sessions:

> *"I faced some difficulties and felt confused the first time, then I felt that I was learning a lot and became interested in it (P.6)."*

Further elements that affected the confidence of participants were having a safe and suitable space in which to hold the sessions.

> *"After the first sessions I felt much better: I felt it was a good environment that we worked in, all together, to be better. Also, you when you shared your personal experience it made us feel really comfortable (P.7)."*

They expanded on this point by explaining that attending the sessions had helped them to feel more confident in using different ways of changing their children's health behaviours (i.e., snacking and sedentary behaviours).

> *"I learned a lot of different ways that we can use to deal with my daughter's snacking. I noticed that I increased my interaction with my daughter and some other things that I didn't know before and they are helpful, so the booklet was so helpful for me (P.8)."*

Many of the above elements mentioned by the participants were deliberately designed in order to overcome barriers identified in accessing this population. Therefore, the findings related to self-efficacy are considered highly connected to the intervention coherence, which is not usually the case, but is valid in this specific sample.

> *"For me… mmm… to be honest I needed to feel that we are doing at least something right… I do not know If you understand me… basically I liked how you motived us and give us accreditation on what we do right.(P.23)"*

Burden

This construct refers to the perceived amount of effort that participation in the intervention required from the mothers. Overall, attendance at the sessions was perceived by the mothers as requiring little effort, with participants explaining how they found the duration of the sessions to be suitable and able to be readily accommodated within their demanding schedules:

> *"I think it is enough, especially as we are mothers, we are busy with cleaning and cooking so an hour was suitable for me (P.9)."*

Where participants disagreed, they wished for longer sessions.

> *"It was not enough for me. I needed more time to have more information and I liked having an hour to myself, learning something good for me and talking to other mothers, so maybe you can make it 2-3 months (P.8)."*

Regarding the other components of the "Be healthy" intervention, like the booklet and WhatsApp group, the mothers perceived these as an effort. They explicitly stated that they did not have sufficient time to be fully engaged, or even simply involved, in all of the aspects of the intervention:

> *"Sometimes, I felt that I did not have time to access videos shared in the group, but I returned to them later to watch them again and catch up on what I had missed (P.1)."*

In terms of the mode of delivery, participants preferred online to in-person delivery as they perceived it minimised the required effort.

> *"For me, I prefer it online, especially now during the pandemic, as everything is online, so I feel it was easy for me to access it (P.5)."*

Certain aspects of the intervention design were highlighted as being helpful to the management of barriers to engagement. For example, some mothers reported that using the Arabic language made engagement and expression in the intervention easier, more comfortable and, as a result, less burdensome.

> *"Although I have a good level of English, I felt more comfortable when I spoke Arabic. I felt better able to express myself clearly. I did not want to feel like I was going to class and that I had to prepare what I was going to say and find the right words to express those ideas, especially when I was talking about my family and my kids. I wanted to feel more comfortable, so I think that's why Arabic was the best choice (P.22)."*

Therefore time, language and knowledge could reflect the burden. This construct is considered as being highly related to opportunity cost.

Ethicality

This construct reflects the extent to which the "Be healthy" intervention was aligned with the value systems of participants. In general, all respondents stated that they considered the intervention to be a good fit with their personal values. Participants reported that they perceived that importance of the intervention and its relevance to their personal context.

> *"All the topics that we have discussed in the sessions were very important to me and I needed help with them. So these sessions were like the guide for me to start and tackle these issues with my kids. It came at the right time and it saved me. The information shared was valuable and very helpful. It is highly appreciated (P.23)."*

Some participants discussed personal values about the appropriateness of the intervention, sharing that they considered the intervention easy and appropriate to their busy lifestyle as mothers.

"I liked that we have one session each week to have enough time to work on the goal. And to see what happens during the week. I also liked that it was one hour, especially for me with kids in school and a baby, I am quite busy so having an hour a week was suitable (P.23)"

7.5 Discussion

This is the first study to assess the acceptability of a culturally appropriate intervention targeting refugee parents of young children to support behaviour change. It is also the first use of the TFA in an intervention directed at non English speaking families. Participants reported a positive attitude towards their attendance at the intervention, which they perceived as being effective in motivating and initiating behaviour change. Overall, the "Be healthy" programme was deemed as acceptable, well liked, and simple to use and understand. Participants felt that the intervention was designed in a way that had many cultural considerations, with the consequence that it fitted well with their cultural norms and value system. These factors added to their overall sense of acceptability.

The participants reported many benefits regarding the "Be healthy" intervention. Attending the course provided the opportunity for social support, with participants reporting that it provided a welcoming and supportive environment. This is in line with previous research with refugee families, which have recognised the importance of social support, sharing experiences and advice in a non-judgmental environment (Huisken et al., 2021; Wieland et al., 2018; Wieland et al., 2015b). Another important benefit was that the intervention improved participants' self-efficacy, with several mothers reporting that they felt more confident about starting behaviour changes (reducing snacking, reducing time spent in sedentary behaviours) after attending the intervention. That may be an important benefit, since low self-efficacy has been cited as representing a barrier to eating healthfully (De Lepeleere et al., 2015; Van Stappen et al., 2019; Wieland et al., 2018).

Participants reported a clear understanding of the aims of the intervention and perceived these as being relevant to them. They also highlighted the importance of some of the cultural considerations that were implemented in the intervention design, which resulted in positive attitudes towards the programme and high

levels of engagement. This view reflects the need for tailoring the interventions specifically targeting ethnic minority groups. This is supported by the wider literature which highlights the importance of cultural adaptation in designing interventions for refugee populations, to increase the acceptance of these provisions (Spanhel et al., 2019). This result echoes the findings of a previous intervention targeting refugee women, which found that culturally and linguistically interventions have persisting effects and decrease the health disparities (Percac-Lima et al., 2013; Rodriguez-Torres et al., 2019).

Participants also reported a good understating of the BCTs applied within the intervention and specifically mentioned several (e.g., goal setting, problem solving and action planning). This reflects the coherence of the "Be healthy" intervention. This is supported by previous research, which concluded that the use of these BCTs is highly effective (Cradock et al., 2017).

However, it should be noted that some participants reported that certain different components of the "Be healthy" intervention, such as the WhatsApp and the booklet, were a burden and needed effort to fully engage with. This was especially the case for mothers who were busy, whose level of literacy was lower, or had more than one child; these mothers reported not having enough time to be active on the WhatsApp group. As well as the WhatsApp groups perceived as burden for some participants especially where the level of literacy was lower. Several measures were taken to address these difficulties, for example, the researcher read out the study materials such as participant's information sheets PIS and sent it as a voice note to these participants. Another example, the researcher used different Arabic dialects and real-life examples from their lives during the sessions to maximise and enhance their engagement. There is scope to develop this further, for example through videos and visual aids. This is aligned with previous research that revealed that multicomponent family interventions could be perceived as burdensome by busy parents (Browne et al., 2020). Generally, however, the different components were perceived positively by other participants, especially the WhatsApp component, which was viewed by most of the mothers as being valuable in supporting the social connections that they highly valued in this intervention. The use of digital technologies and social media platforms have demonstrated effectiveness among refugee populations, providing opportunities to strengthen social support among displaced communities(Ahmed et al., 2020; Sseviiri et al., 2022).

Views were also mixed regarding the level of the information provided in the "Be healthy" intervention, with some participants perceiving the level to be suitable and appropriate, while others would have preferred a higher level of information, with more technical, specialised provision. The differences in the responses given by participants to the question on affective attitudes regarding the intervention components is an interesting and novel finding, which could lead to the conclusion that this intervention might be developed in a way to be more suitable for parents with lower levels of health literacy. This finding could have valuable implications for targeting sub-populations. Therefore, more research should be undertaken to understand if multicomponent interventions impact the overall acceptance of interventions, especially in the refugee population.

The findings suggest a number of areas where refinements could be made for a future version of the "Be healthy" intervention. Recommendations indicate that improvements should be made to the referral process, specifically regarding making the level of difficulty clearer to potential participants. This supported by the literature which concluded that sharing of information and effective ways of delivering it, in addition to the clarity with which it is delivered, are all essential aspects of communicating with refugees that have a huge impact on their attendance, accessing services(Au et al., 2019; Warner et al., 2021). Changes may also be needed to the direction of discussions during the sessions, as participants reported the need to share more positive experiences and solutions, rather than focusing solely on negative experiences. Despite the booklet generally being deemed to be suitable and appropriate, some participants suggested the need for more photos to support the accessibility of the information (McBrien & Day, 2012; Murray et al., 2010). Some participants identified the potential for organising the groups based on their nationalities, as they thought that to be more appropriate given the similarities between them, which they felt might support the social connections. This idea only appealed to a minority of participants, who felt more confident about sharing and speaking around people from the same country as themselves.

Regarding the second aim, the framework was useful in analysing and organising data and identifying important elements of acceptability. However, certain key issues were identified during the analysis. One was the overlap between the definitions of the construct, which caused confusion in the coding stage. For example, there were discussions around the difference between intervention coherence and self-efficacy, in which self-efficacy is closely related to intervention coherence, which is based more on the participants' belief that they

can perform the behaviours needed to participate in the intervention. Another conflict reflected in the data was between the meaning of opportunity cost and burden, specifically around the issues of fit regarding data relating to 'time'. In light of this overlap, it may be necessary to refine definitions between construct coding and traditional coding in order to facilitate coding in this way.

7.5.1 Strengths and Limitations

This is the first study that has reported the evaluation of the acceptability of culturally appropriate intervention for refugee parents with young children, using the TFA. This study may add new insights and understanding to the literature of preventing childhood obesity among refugee populations. One of the key findings that contributes to the knowledge regarding behaviour change in this underserved population is that a high level of acceptance was found for the overall approach to motivate and initiate behaviour change. This study also has some key strengths, which included delivering culturally appropriate intervention in participants' native language. This strength is crucial to enhancing the effectiveness of the intervention. This is supported by recommendations of best practices when designing programs delivered in the people's original language were twice as effective as those delivered in a second language (Murray et al., 2010). Other strengths of this study include the good level of participant's engagement with the intervention's components. This is considered an effective strength since participant's engagement with the intervention could increase the achievable intervention impact, as well as increase data quality (Silva et al., 2022).

Although the TFA has been reported in a growing body of literature, the details and critical analysis of its use is not widely reported. This study can therefore be considered a valuable contribution to the literature, as it reports the use of the framework and conducts a comprehensive assessment of its utility in this population.

It is acknowledged that there are limitations to the study. One of these limitations was in the delivery of the intervention, specifically in the fact that the programme was delivered and evaluated by the first author. This may raise two main issues, first of all, it might result in some potential risks regarding potential biases, and they were acknowledged from the beginning and due to the inevitable nature as well as limited resources. However, some measures was put in place to address these risks of biases. To identify potential biases, for example, the lead researcher practised reflexivity from the very beginning and spent considerable time in

comprehensive self-reflection. In addition, sharing these biases with the wider research team was helpful in minimising the influence on the data interpretations, involving the research team in the different stages of the study and analysis enhanced the quality of the analysis. These measures might minimise the impact on the results due to the fact that the participants felt comfortable enough to share some level of criticism, although they may have overemphasised some aspects, such as perceived effectiveness. Having almost 95% of those who took part in the intervention also participate in an acceptability study assures us that we are not hearing only from those who liked it. Secondly, this raises some questions regarding the sustainability of the delivery of this intervention in the future. The intervention was delivered by the researcher who developed it, and had expertise in the behaviour change techniques. It is important to understand who else could deliver the intervention at scale and in the longer term and, what training and support they would need. Therefore, conducting further research is needed in order to assess the feasibility and the effectiveness of the intervention in different contexts and address some of these issues.

7.5.2 Conclusion

The "Be healthy" programme was perceived as being easy and straightforward to use and understand, fitting well with the day-to-day lives of participants, who perceived the course to be useful.

Chapter 8. General discussion

8.1 Section overview

The final chapter summarises the research findings within this thesis and the key discussion points, as well as providing an overview of the strengths and limitations of the programme of research presented within the thesis. It also discusses how the work undertaken in this PhD may impact practice and policy, and possible avenues for future research that could be conducted in light of this work.

8.2 Summary and discussion of key findings

The main aim of this thesis was to support the prevention of childhood obesity among refugee populations, which was achieved through four stages. Below is a summary of the key findings of each of these interrelated studies:

1) The first study was a systematic review of the literature to determine the factors that influence the obesity-related health behaviours of refugee families who have young children. The findings from this review highlight that the main factors that influence health behaviours include: Acculturation, Environmental, Socioeconomic, Cognitive, and Family Factors. Importantly, the findings support the powerful role of parental practices over health behaviours of young children, as well as the direction of that influence and how it might affect the development of childhood obesity in this population. These findings suggest the need to further explore the role of these parental practices and also helps inform the design of the intervention. This systematic review contributes to the literature by suggesting a number of recommendations including how healthcare professionals, researchers, and policy makers can improve the treatment and prevention of obesity among refugee children.

2) A qualitative study was conducted to explore the experiences and perspectives of refugee parents regarding their children's health behaviour changes (i.e. diet and physical activity) and the impact of these changes on the health of their children aged 2-10 years. This study utilised creative qualitative methods, with photo elicitation interviews providing another layer of depth to our understanding of the experience of parents. The main results highlight parental challenges and the impact of these on their children's health behaviours, such as altered parental roles in response to the dramatic change in the environment

post-resettlement, the implications of acculturation on their role as parents, and the subsequent impact on their children's health behaviours. The results of this thesis highlight the importance of certain challenges mentioned by parents in the qualitative study, such as the significant impact of social support and relationships on the physical activity of the young children resettling in the UK. Furthermore, the study findings demonstrate that the cultural beliefs regarding what is considered to be healthy can have an impact on parents' feeding practices and, as result, on their children's health behaviours. Finally, parents highlighted two obesity related health behaviours of particular concern: increased sedentary behaviour and consumption of unhealthy snacks. These results underscore the importance of developing an intervention that targets these health behaviours in a culturally appropriate way.

3) The third study informed the development of an intervention that targets young children's health behaviours (snacking and sedentary tendencies). Through the use of the COM-B model (Michie et al., 2014) and Theoretical Domains Framework (Cane et al., 2012), the intervention was developed to meet these aims, taking into account their cultural considerations during the design process. The researcher identified that changes were required regarding:
    a. Psychological Capability: These barriers lay in the psychological capability of parents' knowledge, memory, attention and decision-making processes in relation supporting their children in making behaviour changes.
    b. Physical Opportunity: Barriers related to physical opportunity, specifically the limited physical space available in which their children could be active. Additionally, parents cited a lack of time as a barrier to supporting their young children in being more active, as well their inability to prepare healthy meals for their children and to manage or curtail more frequent snacking.
    c. Social opportunity: As part of the social opportunity analysis, particular attention was also paid to the effects of social influences (the lack of social support and social pressure) on the behaviour changes of young children.
    d. Reflective motivation and automatic motivation: Parents' emotions have been identified as barriers that could potentially prevent them from fully supporting behavioural changes.

4) The behaviour change techniques (BCTs) selected following the behavioural diagnosis were as follows: (5.1 Information about health consequences, 1.1. Goal setting (behaviour), 1.2 problem solving, and 4.1 instructions on how to perform the behaviour, 2.3 self- monitoring; 4.2 information about antecedent and Social support (unspecified) 3.1). These BCTs enabled “Be healthy” to be designed as a multicomponent intervention based on the BCW guidelines and informed by the first two studies, PPI involvement and the broader literature. This intervention involved the “Be healthy” booklet, sessions, WhatsApp group and messages, and was delivered online via Zoom and assessed for acceptability. The findings concluded that participants rated the “Be healthy” program as acceptable, well liked, and easy to use and understand. They also felt the intervention was designed with many cultural considerations in mind, which meant it was well suited to their cultural values and norms. These factors added to their overall sense of acceptability.

8.3 Sustainability and implementation in the future

The final study involved refining the intervention by evaluating its acceptability to the refugee population. The results of the Theoretical Framework of Acceptability (TFA) (Sekhon et al., 2017) assessment indicated that the intervention was acceptable and easy to use, with appropriate content that fitted well with the parents personal systems. As a result of the data analysis, some additional refinements were made to make the “Be healthy” intervention more appropriate to participants, including adding more photos to the booklet to make it more accessible, organising the groups based on the nationalities of participants to enhance the social support, and improving the referral process to increase engagement.

Some limitations should be acknowledged. A key limitation is that the intervention was delivered by the main researcher. It is important to highlight that it was intended for support workers within the refugee organisations to be among the potential providers; however, the COVID-19 disruptions and time restraints inherent to doctoral research resulted in the author of this thesis delivering the intervention. Consequently, there are questions regarding the sustainability of this intervention going forward. Questions include who else, in what role, can deliver this intervention if it becomes more widespread.

Based on data collected for the acceptability study, recommendations that could inform the future implementation of the “Be healthy” intervention has been highlighted. Results from the acceptability study

suggest that the intervention is promising if some of the suggested refinements are made. The results also suggest that there is scope for using “Be healthy” face-to-face in other settings, such as in refugee organisations. Participants from the acceptability study highlighted some personal characteristics of the providers that could enhance the delivery of the intervention. Sharing similar culture or having one of the research team from the same culture could provide sufficient levels of familiarity, understanding and support and promote engagement. In addition, offering participants opportunities to converse in their native language can overcome many barriers and enhance participant’s engagement. For example, bilingual support workers could deliver the intervention if they receive brief training to ensure the intervention is delivered as intended. Another example could be a trained bilingual group of members from participating communities providing peer delivery. Therefore, when thinking of the sustainability and implementation of the intervention on a border level, these concepts need to be considered.

8.4 Research contribution

This thesis provides a comprehensive and deeper understanding of the different ways in which it might be possible to tackle childhood obesity among this population. Firstly, this research specifically focuses on the refugee population, synthesising the literature to identify the factors that influence obesity related behaviours in order to explains how these factors influence the development of obesity in this population. Secondly, the creative qualitative methods approach has provided a novel insight into the experiences and perspectives of refugee parents and how they reflect on their roles regarding the behaviour change of their young children during the post-resettlement period. The research also provides a systematic process for the design of a culturally appropriate behaviour change intervention informed by the need to prevent or mitigate childhood obesity among this population. Finally, the study has tested the acceptability of the delivery of the intervention to improve any future implementation, with the involvement of the PPI playing a critical role in the enhancement of the described intervention and future recommendations for research within this population.

8.5 Strengths and limitations

The following section outlines the strengths and limitations of the body of work presented within this thesis.

8.5.1 Strengths

A strength of this thesis is the development of a novel, useful and culturally appropriate intervention that has responded to the global need for cultural adaptation processes and strategies for early childhood health promotion and obesity prevention interventions targeting specific communities (Marshall et al., 2022). This PhD focused on refugee families with young children and childhood obesity, thereby addressing the lack of research focused on this population in relation to childhood prevention interventions (Marshall, 2022).

A further strength of this thesis is its originality in investigating the specific experiences of refugee families. Refugee parents with young children are considered to be a hard-to-reach population, therefore, focusing on them is considered a key contribution to the literature in itself (Aljadeeah, 2022; Wahoush, 2009). The systematic review was the first to synthesise the literature on changes in diet and physical activity levels among refugee families and identify the factors influencing health behaviours and childhood obesity among refugee children. This review also successfully identified a need for further research focusing on the opportunities for intervention and support, looking at the influence of parental practices on children's health behaviours, especially young children due to their greater exposure to parental control than adolescents. The use of multiple high quality research methods is another strength of this thesis, with the application of a detailed approach to intervention design and development based on empirical evidence and theory, enabling a detailed exploration of specific issues experienced by the study population.

The work presented in this thesis involved Patient and Public Involvement (PPI) activities that hugely enhanced the engagements and addressed some of the recruitment barriers, which resulted in more successful recruitment of individuals from this underserved group. This public engagement work not only benefited from their input and informed the research, but also supported the participants to take part and engage with the intervention. For example, helping participants with low literacy levels to download some of the applications (WhatsApp and Zoom), also providing voice recordings allowed them to participate in the intervention. The literature supports the positive association between PPI and recruitment reported in the literature (Aljadeeah, 2022; Bonevski et al., 2014; Warner et al., 2021). The PPI activity occurred throughout the research process, but was especially beneficial in terms of refining the data collection tools and the intervention design. This level of involvement has been reported to have positive impacts at all stages, including improving its quality

and appropriateness, enhancing researchers' understanding and insight into their field, and increasing the sense of self-worth, confidence, and skills of participants in PPI (Blackburn et al., 2018; Fletcher et al., 2022).

A further strength of the thesis is refining the intervention, which includes assessing the acceptability of the intervention to this population. Although this stage is not mentioned in the BCW, the MRC guidance and NICE guidelines (2007) for developing complex behaviour change interventions recommend this stage as an important part of the refinement process (Skivington et al., 2021). This stage played a significant role in the assessment of the intervention and helping to determine whether it was considered acceptable to refugee parents. Recent research emphasises the importance of assessing the acceptability in the short-term to enhance and ensure the long-term successes of interventions, based on the views of the intervention developers and stakeholders (Turner et al., 2019). Findings from the acceptability study included suggestions and changes to the intervention, such as making the information more accessible with the addition of photos, managing participants expectations regarding the intervention, and refinement of content to increase engagement with the intervention.

Finally, another strength of this research which was critical to its success, is that the main researcher is bilingual and comes from a similar culture to the population under study. This provided a number of advantages. Due to her origin, the researcher was able to conduct the research in Arabic and in different local Arabic dialects, had better understanding of participants' cultures and traditions, and was sensitive to their beliefs. These factors have been acknowledged as contributing to the success of interventions in this field (Marshall et al., 2022; Moore et al., 2015; Movsisyan et al., 2019).

8.5.2 Limitations

This research had certain inherent limitations, which have been discussed as they pertain to each study within the relevant chapters. In this section, the main overall limitations of this thesis research are discussed.

First, a key limitation of this thesis was the limited number of fathers in the sample, despite the best efforts of the researcher to recruit males. This is a commonly cited limitation in research that involves parents but has proven to be especially common in studies of refugee populations (Davison et al., 2018; Davison et al., 2017; Keys et al., 2019). Many factors exist that could potentially explain the limited involvement of fathers and the

gender effect on the recruitment process. The researcher was informed by multiple fathers that speaking with their wives would be more appropriate due to a lack of time and a belief that their parental role was less important. It has been assumed by some fathers that, because the researcher is a woman, she would prefer to speak with their wives instead of them, despite it having been explicitly stated she would. It is evident that gender has an impact on recruitment, which is consistent with findings in the literature regarding studies with populations from specific cultures, such as Middle Eastern refugees. Studies targeting underserved populations, such as refugees and specifically refugee fathers, require time to build a trusting relationship. Interviews are particularly reliant on openness about a variety of very sensitive issues, such as parenting, gender roles and situation in their new country (Bond, 2019). This reflects a need to improve the methods and strategies used in recruiting fathers in research involving refugees (Yaremych & Persky, 2022).

Another limitation to this research is that in the fourth study, data was analysed using a deductive approach and findings were structured using the TFA framework. Using a framework when analysing data may limit a study's ability to accurately represent the full dataset, as it restricts researchers' focus to pre-determined areas. Therefore, in the fourth study an initial open coding phase was conducted in order to identify aspects of the data that were not part of the framework, in order to limit the impact of this.

Another limitation to this research was that the intervention was delivered and evaluated by the main researcher, which might raise some potential risk of biases as it might have an impact on the way data were generated and concluded. For example, some types of potential biases include social desirability bias (i.e. where participants conceal their true opinions or experiences by answering questions that make them look good to others) and reporting bias. This risk of bias could have influenced the quality of the findings. However, this limitation was addressed and mitigated by several measures. First, in an attempt to reduce the possibility of researcher bias, these potential biases were acknowledged from the beginning where the lead researcher practised reflexivity to identify these biases and sharing it with the research team to help minimise the influence on the data generation, interpretations, and findings. By involving the research team in the different stages of the study and analysis, this enhanced the quality of the analysis. Secondly, the first author was sufficiently trained to deliver the intervention; she is as a doctoral-level trained psychology researcher with expertise in delivering behaviour change techniques and is bilingual in the required languages (Arabic and English). Specific intervention training involved approximately 200 hours of self-learning on group

facilitation and the principles and practice of motivational interviewing (MI) techniques, and continued supervision from a health psychologist for the duration of the programme. This preparation played a significant role in achieving positive feedback regarding the delivery of the intervention. Finally, some of the participants felt comfortable enough to share some criticisms of the intervention content and delivery, which presented a good attempt to reduce the potential social desirability bias.

The final limitation to this research related to the approach was taken to tackle obesity. A growing body of evidence suggests that whole systems approaches may help combat complex problems, such as obesity (Bagnall et al., 2019; Sawyer et al., 2021). In addition, Public Health England recommended an approach to tackle obesity(Copeland et al., 2020). Therefore, designing the "Be Health" based on individual-based intervention could be considered as a limitation, although it is considered a valuable part of a larger picture in addressing obesity.

8.6 Researcher Reflexivity

There is always a contextual element to qualitative research; it takes place at a specific time and place among two or more people (Dodgson, 2019). The idea of reflexivity acknowledges the involvement of the researcher in, and influence on, the research process at specific points in time, places, and with specific individuals. In addition to enhancing the credibility of findings, reflexivity deepens our understanding of the work if the researcher describes the contextual intersections between the participants and themselves (Olmos-Vega et al., 2022). In qualitative analysis, interpretation is very much influenced by the researcher. Therefore, reflexivity is crucial throughout the analysis to avoid biasing the interpretations to the point of losing their validity.

This section provides the researcher's personal reflection on the current research and is therefore written in the first person.

From the early stages of this research, I was aware of the influence of my background as an Arabic researcher on the direction and interpretation of the research results. As a female researcher from a similar culture to the population under study, as well as speaking the same language and having a similar experience of being from a developing country and resettling in a high-income country, meant that I was likely to have a better

understanding of their experiences. At the same time, it was important to recognise and be aware of the influence of my personal perspective and experiences on the research.

Reflexivity began at the very early stages of the research, during the development of the study. Therefore, I spent extensive time in comprehensive self-reflection in order to identify my potential biases. The first step involved reflecting on the fact that I was originally from Saudi Arabia and am now living in the UK, that I am a mother of two young children and that I am a student pursuing academic qualifications, which is the reason for which I conducted this research. The second step involved thinking carefully about how these existing elements and my position in the context would impact not only how I conducted the research, but also how I analysed the data. The process of keeping my biases separate throughout my studies became an active, ongoing one, once I became aware of them.

In my preparation for the photo elicitation interviews, I worried that my lack of experience living through war and being forced to leave my home country would prevent me from comprehending the challenges and needs of the study population. During the interviews, my role was the primary researcher and I also allowed myself to connect to the participants as a mother with young children (I considered myself an insider), which had a positive impact on the recruitment process, as well as fostering engagement and building the rapport with the refugee parents. However, I felt that my experiences were very helpful in understanding the challenges that they faced in the resettlement period. In addition, my deep understanding of the culture and speaking a different dialect of the same language allowed me to be accepted by the refugee community, facilitated the recruitment and, perhaps most importantly, reduced the misunderstandings and miscommunications usually associated with the ethnic minorities research. However, being a female researcher from Saudi Arabia acted as a barrier to the recruitment of a sufficient sample of fathers in the study. I sensed that when I approached fathers, they would ask me to speak to their wives instead, which likely reflected some level of gender effect and certain cultural norms. At the intervention design stage, I realised that I was able to connect to the participants' challenges and difficulties, so in an attempt to avoid being in a position of assumption in the acceptability study I tried to adopt a 'beginner's mind' during data collection by asking for examples to clarify points further.

During the interviews, I sometimes struggled with feelings that I wanted to provide lots of help and support. I managed this emotion by having regular meetings with my supervisory team to debrief and gain emotional support, as well as by seeking guidance if any issues arose. To ensure that my high involvement with the data collection would not bias the results of papers two and four of this thesis, I worked very closely with my supervisory team during the analysis stage. Although this research has presented many challenges, it has also provided me with many opportunities to enrich my knowledge and skills for future research and practice. The ability to stand back and look at the research from a holistic perspective as well as being reflexive were beneficial to ensuring a high standard of work.

8.7 Implications of findings

This section will discuss the implications of the findings of this doctoral study, with specific reference to its implications for practice and future research.

8.7.1 Implications for practice

One of the biggest impacts of this research is its direct significance for practice, as it has resulted in the design of an intervention that can be used within refugee organisations in the future. The social workers within the refugee organisations were enthusiastic about the study and seemed willing to collaborate in the future in the implementation of the intervention within their service. Through the intervention, refugee organisations and other services that deal with refugee families would gain access to the following key elements:

- The provision of service users with culturally appropriate resources, such as the “Be healthy” booklet, which promotes healthy feeding and an active lifestyle for young children.
- The enhancement of active social support for refugee families, fostering opportunities for social relationships to be established or developed.
- The expansion of the capacity of services to work cross-culturally through the recruitment and training of more bi-cultural and bi-lingual staff.

The significance of this research and its results have been recognised nationally and internationally. The researcher has been accepted to share the study results in multiple conferences, including the DHP (the annual conference of the Division of Health Psychology) in 2019 and 2021, and the EHPS (the annual conference of

the European Health Psychology Society) in 2019 and 2021. The impact of this PhD was recognised by the Doctoral Academy at The University of Manchester, with the researcher being awarded as the Postgraduate Student of the Year for School of Health Sciences 2022, in recognition of the impact of this research.

The cultural tailoring of the intervention may also have a significant impact, by showing that this approach could be a promising strategy in improving engagement with behavioural change interventions among culturally diverse communities. In addition, the photo elicitation qualitative study can also provide a practical example of the benefits of using creative qualitative methods supported with visual aids as a valuable tool in facilitating deeper understanding of the experiences of refugee families. The research can highlight the importance of the fact that it is possible to achieve reductions in health disparities among culturally and linguistically diverse families through culturally competent healthcare programmes, services, and systems.

8.7.2 Impact on future research

The findings of each of the individual studies may have a potential impact on future research. For example, the systematic review contributed to the existing knowledge by obtaining a deeper understanding of the complex factors that influence obesity-related health behaviours in refugee children after their resettlement in developed countries. This systematic review covered a gap in the literature by focusing on the specific needs of refugees and explicitly distinguished them from other groups of immigrants that will not typically have faced the same severity of challenges. These factors illustrate the importance of early childhood in the long-term development of obesity, as well as the role of parents in influencing these behaviour changes in their young children. This systematic review informed our second study, which considered the first study that focused on the experiences and perspectives of refugee parents of young children in their roles in influencing obesity related behaviours and behaviour change. In addition, the qualitative findings can contribute to a much-needed body of literature around the role of refugee parents in influencing their young children's health behaviours and the development of childhood obesity. This study informed the design of a more culturally appropriate intervention for this population and, in this sense; the intervention design process may also contribute to the literature in terms of the use of the BCW in designing interventions for this population. This thesis added a deep understanding of the challenges that refugee families face and provided the systematic development of a culturally and linguistically appropriate intervention, with the evaluation of the acceptability of its delivery and the final refinements to maximise the success of any future delivery of this programme.

8.8 Recommendations for future research

A fundamentally important aspect of this research is drawing the results together to provide recommendations for future research, as detailed in the individual papers. First, it would be valuable to evaluate the implementation of the intervention face- to face on larger scale within refugee organisations, particularly delivery of the programme by the support workers within that service. As outlined in the new guidance from the MRC, feasibility studies are performed for two purposes: to assess the feasibility of the intervention itself and to determine whether the evaluation will be feasible. An evaluation feasibility study would therefore be the next step, which will assess and refine issues relating to recruitment, retention, sample size, and randomisation (Skivington et al., 2021). Establishing effectiveness consider another stage of intervention development process as it allows determining whether or not the intervention actually supports behaviour change.

With reference to the lack of fathers in the sample, particular attention should be paid to improve the recruitment strategies to enhance the engagement of refugee fathers, for example by employing male research assistants. Another important recommendation for future research focused on refugee families is to allocate more time to planning and preparation, as recruitment can be challenging. This may be improved by public involvement from the early stages of the research. Another important recommendation involves ensuring that the researcher comes from a similar background to the refugee population, as this has been shown to help and support the cultural adaptation of the research, in addition to balancing the dynamic power within the research process. Finally, research should be conducted with high levels of sensitivity and understanding to improve the engagement with the research.

8.9 Conclusion

This thesis provides some new insight into the different factors influencing health behaviours related to obesity among refugee families with young children after resettlement in developed countries. It provides an understanding of how parental practices influences their children's health behaviours. Following the behaviour change wheel guide to intervention design, and combining literature and findings from earlier

stages of the PhD, a culturally adapted intervention that targets snacking and sedentary behaviours has been developed. Based on the theoretical framework of acceptability, "Be healthy" was perceived to be effective and acceptable by participants. As part of the process, PPI were involved throughout, which enhanced the design, cultural considerations as well as assisted in overcoming some barriers in recruitments. It would be beneficial to conduct RCTs to examine the effectiveness of "Be healthy" in the future. Efficacy may allow it to be transferred to other similar groups, but it must be customised to the particular situation.

Reference

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Appendices

Appendix A. The cultural quality of the included studies

1. Quality assessment of the cultural sensitivity of the included studies:

All the studies were subjected to a cultural check, which was an especially important assessment given the focus of this systematic review on refugee parents and children, who represent an ethnic minority in developed countries. As noted above, the 'cultural quality check' was conducted utilising the test from a previous systematic review (Waquas, 2010; Nazir, 2015). The check comprises twelve areas and was developed for a specific population. However, the included questions were adapted to make them as general as possible, to cater to the variety of cultures included in this review (see Tables 7, 8, 9).

During appraisal of cultural quality, it became clear that studies conducted on refugees have a wide range of methodological issues. A more detailed discussion of cultural quality of the included studies is provided below:

1. Any of the authors from the same ethnicity background of the participants?

Only one out of nineteen studies involved a large number of authors (five) from the same ethnic background as the sample population, reflected in greater consideration of cultural issues in the design and practice of the study (Keita et al., 2016). Eleven studies only had a single author from the same ethnic background as the participants (Renzaho & Burns, 2006; Renzaho, Swinburn, & Burns, 2008; Peterman,

Silka, Bermudez, Wilde & Rogers, 2011; Mellor, Renzaho, Swinburn, Green & Richardson, 2012; Griffith, Mellor, Green & Renzaho, 2014; Gichunge, Somerset & Harris, 2016; Cyril, Halliday, Green & Renzaho, 2016; Renzaho, McCabe & Swinburn, 2012; Wilson & Renzaho, 2015; Wilson, Renzaho, McCabe & Swinbur, 2010; Renzaho, Green, Mellor & Swinburn, 2010). Three out of nineteen studies did not include any authors from the same ethnic background of the population, and the remaining (four) studies showed medium to low involvement of authors from the same background.

2. Was the ethnicity of the target population defined?

Not all of the studies provided clear definitions of the targeted population. Three studies defined the ethnicity of the targeted population by stating their originating country (Tiedje et al., 2014; Patil, Hadley & Nahayo, 2009; Rondinelli et al., 2011). Three other studies provided more detailed definitions, which created a more complete picture and helped to link the findings with the same ethnicity (Vue, Wolff & Goto, 2011; Renzaho, McCabe & Swinburn, 2012; Wilson & Renzaho, 2015).

3. Special consideration in selecting measuring tool:

Two studies developed the measurements used in their data collection. Renzaho, Swinburn, & Burns, (2008) developed dietary intake, in addition to a specific physical activity and sedentary behaviour questionnaire, taking into account the specific characteristics of the target population. Two studies translated and adopted tools for the purpose of the study (Peterman, Silka, Bermudez, Wilde & Rogers, 2011; Griffith, Mellor, Green & Renzaho, 2014). Three other studies used pre-existing measurements tools and translated, refined and tested them for suitability and cultural sensitivity with respect to the study population (Dharod, Croom & Sady, 2013; Gichunge, Somerset & Harris, 2016; Morrison et al., 2017). However, five out of nineteen studies did not make any special provision for the tools used.

4. Language offered:

The majority of the studies offered both English and the native language of the target population. Only three studies did not record the offered language (Renzaho, McCabe & Swinburn, 2012; Griffith, Mellor, Green & Renzaho, 2014; Renzaho, Swinburn, & Burns, 2008). One study offered only English (Vue, Wolff & Goto, 2011), which was justified with reference to the high level of English fluency among the participants, meaning that they did not face any difficulties expressing themselves in English. The language offered to

participants said a lot about the culture sensitivity of the given studies, especially the qualitative studies, in which the option to speak in their own language meant that participants were empowered to express themselves more accurately and easily, giving a clearer picture of their challenges. However, conducting the interviews and focus groups in the native language of the population also created the risk that data might be lost in the translation process, therefore it was important to review the translation process of these studies to determine whether the translation process was sufficiently rigorous.

5. **Language Opted - Ethnic/English:**

None of the included studies mentioned the language preferred by participants. However, some studies mentioned this issue during the translation process.

6. **Process of translation**

Six out of nine quantitative studies did not mention the translation process of the questionnaires or the measurement tools used in the studies (Renzaho & Burns, 2006; Renzaho, Swinburn, & Burns, 2008; Dharod, Croom & Sady, 2013; Griffith, Mellor, Green & Renzaho, 2014; Anderson, Hadzibegovic, Moseley & Sellen, 2014; Cyril, Halliday, Green & Renzaho, 2016). However, the remaining three studies mentioned the translation process in detail, reflecting higher cultural quality (Peterman, Silka, Bermudez, Wilde & Rogers, 2011; Mellor, Green & Renzaho, 2014; Gichunge, Somerset & Harris, 2016; Morrison et al., 2017)

Four out of eight qualitative studies recorded the translation process of the interviews and focus groups in greater detail, which is an especially important consideration in qualitative studies as this directly influences the quality of obtained data and therefore the study findings (Tiedje et al., 2014; Rondinelli et al.., 2011; Wieland et al., 2015; Wilson & Renzaho, 2015). As mentioned above, the translation process in the qualitative study should be undertaken with caution, because it influences the quality of the findings. This reflects higher level of cultural and methodological quality. However, the rest four studies that did not recode the translation process.

7. **Ethnic matching of interviewers:**

The interviews in one study (Vue, Wolff & Goto, 2011) were conducted two researchers from the same background as the study population. Nazir (2015) states that this is an important element in qualitative

studies with ethnic minorities, because it improves the quality of the data, by making participants feel comfortable asking questions, creates opportunities for understanding and empathy, both of which are considered critical, and enriches the data. However, six out of eight of the qualitative studies used professional bilingual interpreters, interviewer and meditators to conduct the interviews and focus groups (Tiedje et al., 2014; Rondinelli et al.., 2011; Wieland et al., 2015; Wilson & Renzaho, 2015; Renzaho, Green, Mellor & Swinburn, 2010; Wilson, Renzaho, McCabe & Swinbur, 2010). Using professional bilingual interpreters can be considered culturally sensitive to a certain point. However, it is essential to train these interpreters to run the interviews correctly and to ensure they have sufficient access to research information.

8. Cultural consideration in interviewer/interpreter training:

Seven out of nineteen studies reported comprehensive training for the interviewers and interpreters, including a range of cultural and ethical issues, safety considerations, and interview techniques. Peterman, Silka, Bermudez, Wilde, & Rogers, (2011), reported that administrators had 40 hours training, while Morrison et al. (2017), Tiedje et al. (2014) and Wieland et al. (2015), reported that interviewers received training by the community organisation that was involved in the research. The remaining studies stated that interpreters and interviewers had training (Dharod, Croom & Sady, 2013; Anderson, Hadzibegovic, Moseley & Sellen, 2014; Cyril, Halliday, Green & Renzaho, 2016). This reflects proper consideration of cultural quality and shows improvements from relatively recent meta-analyses of this issue (e.g. Nazir, 2015).

9. Was the family consulted?

None of the included studies reported family consultation. This is largely attributable to the design of the review, which included parents and meant that consultations were not needed.

10. Were community agencies consulted?

All the studies included in this review cooperated with community agencies working with refugees. The majority of this cooperation was in the area of recruitment. However, five studies reported in-depth cooperation with the community agencies, including not only assistance with recruitment, but also with the

provision of cultural advice (Wilson & Renzaho, 2015; Wilson, Renzaho, McCabe & Swinbur, 2010; Renzaho, Green, Mellor & Swinburn, 2010), while others had help with drafting focus group questions, recruiting participants, and conducting the focus groups (Tiedje et al., 2014; Wieland et al., 2015).

11. Were interpreters used?

It is generally perceived to be important to have interpreters in studies of ethnic minorities, because the language barrier is one of the most commonly reported difficulties in this population. Therefore, interpreters can improve the cultural quality of the study. Seven out of nineteen studies did not use interpreters (Renzaho, McCabe & Swinburn, 2012; Vue, Wolff & Goto, 2011; Griffith, Mellor, Green & Renzaho, 2014; Renzaho, Swinburn, & Burns, 2008) However, three out of these clearly utilised bilingual interviews, despite not explicitly stating that interpreters were used (Cyril, Halliday, Green & Renzaho, 2016; Gichunge, Somerset & Harris, 2016; Anderson, Hadzibegovic, Moseley & Sellen, 2014). The remaining studies used interpreters.

12. Was validity and reliability of translated questionnaires tested?

Four out of nineteen studies tested the validity of the questionnaires used (Mellor, Renzaho, Swinburn, Green & Richardson, 2012; Dharod, Croom & Sady, 2013; Anderson, Hadzibegovic, Moseley & Sellen, 2014; Griffith, Mellor, Green & Renzaho, 2014). However the majority of the studies did not recoded anything on the reliability of the translated questionnaires, because they did not translate pre-existing questionnaires.

Appendix B. The “Be healthy “intervention booklet

Link to the booklet:

https://drive.google.com/file/d/1JcTFEszMo6mHxseUavU-trZKIAMi1dgg/view?usp=share_link

Appendix C. Study 2 Participants Information Sheet

MANCHESTER 1824
The University of Manchester

Participant Information Sheet

Title of Study: The experiences and perspectives of refugee parents regarding health behaviour changes and its impact on weight among their young children

We would like to invite you to take part in a research study about refugee parent's experiences regarding health behaviours changes (changes in diet and levels of physical activity) and their impact on weight among young children. Before you decide whether or not to take part, it is important for you to read and understand why the research is being conducted and what it will involve. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for taking the time to read this.

1. Who will conduct the study?

I am Maha Alsubhi, a PhD student at the University of Manchester. I will be conducting the study under the close supervision of my academic supervisors: Dr Sarah Peters, Dr Tracy Epton and Dr Joanna Goldthorpe , all based at the University of Manchester.

2. What is the study about?

There are many families across the world forced to leave their homes and country of origin due to conflict. Some families resettle in more stable countries such as the UK. After their resettlement families and more

specifically young children go through changes in their health behaviours such as eating patterns and levels of physical activity as a response to the dramatic changes in their environment. Furthermore, these changes can have impact on changes in their weight and health in general.

3. Why have I been invited?

You have been invited to take part in this study because you are a parent aged 18 or above to young children aged between 2-10 years old, have fled your country due to conflict and resettled in the UK. This research will involve parents only not children. We are interested in understanding more about your experience and perspectives around changes in the diet and physical activity of your young children and looking in more details into the important factors that influenced these changes and the impact on their weight and health in general.

4. What will I be asked to do if I take part?

If you decide to take part, you will have the choice between face-to-face or telephone interview. If you decide to take part in face-to-face interview you will be:

- Invited to an interview which will take place at the rainbow Heaven or the University of Manchester.
- Asked to sign a form to say that you agree to take part (a consent form).
- Asked to complete a short questionnaire about your age, gender, the questionnaire can be completed verbally with the help of the researcher if you wish .This should take no longer than 5 minutes.
- Asked to take part in an interview about your experiences:
    - The interview will be one-to-one between you and Maha Alsubhi.

- The interview is expected to last around 40 minutes, but may be longer or shorter depending on how much or little you would like to share.
- You will have the opportunity to take breaks at any time you wish, and refreshments will be provided.
- You do not have to answer any questions that you feel uncomfortable with.
- There will be an opportunity at the end of the interview for you to ask any questions.
- The interview will be audio -recorded.

If you decide to take part in telephone interview you will be:

- First, the researcher will telephone you to arrange an appointment to conduct the interview.
- You will be given the opportunity to ask any further questions.
- The study Consent Form will be explained and obtained verbally.
- Asked to verbally complete a short questionnaire about your age, gender.

This should take no longer than 5 minutes.

- Asked to take part in an interview about your experiences:
    - The interview will be between you and Maha Alsubhi.
    - The interview is expected to last around 40 minutes, but may be longer or shorter depending on how much or little you would like to share.
    - You do not have to answer any questions that you feel uncomfortable with.
    - There will be an opportunity at the end of the interview for you to ask any questions.
    - The interview will be audio -recorded.

5. What will happen to my personal information?

In order to undertake the research project we will need to collect the following personal information/data about you:

1. Contact details (name, contact number, email address)
2. Demographic questionnaire(age, gender information)

3. Consent form
4. Interview data

6. What are my rights regarding my personal information?

You have a number of rights under data protection law regarding their personal information. For example you can request a copy of the information we hold about them, including audio recordings. This is known as a Subject Access Request. If you would like to know more about your different rights, please consult our "Privacy Notice for Research Participants" at http://documents.manchester.ac.uk/display.aspx?DocID=37095

If you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, University of Manchester, Oxford Road, M13 9PL. They are based at the University of Manchester and we will guide you through the process of exercising your rights. You also have a right to complain to the "Information Commissioner's Office", Tel 0303 123 1113.

7. Will my taking part in this study be kept confidential?

Yes, the information you provide in the study will be confidential to the study researchers (mentioned in question 1). All personal information from the interview will be removed and your name will be replaced with a code (e.g. Participant 1). Both the telephone interview and face-to-face interview will be audio recorded and stored securely at the University of Manchester. Quotes from your interview may be used in written reports or conferences, but no names or identifiable information will be included.

In the event that there are concerns about your safety or the safety of others, the researcher has a legal duty to break confidentiality. In instances, there is a possibility that individuals from the University may have access to your information. This will only be to review the study information for auditing and monitoring purposes or in the event of an incident.

8. What happens if I do not want to take part or I change my mind?

Taking part is entirely voluntary. It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself. However, it will not be possible to remove your data from the project once it has been typed up and anonymised as we will not be able to identify your specific data. This does not affect your data protection rights.

Please also note that it is essential to your participation in the study that interviews are audio-recorded. Therefore, to participate, you must be comfortable with the recording process at all times. However, you are still free to stop recording at any time and your data will be removed, if you wish.

9. What are the possible side effects of taking part?

We do not believe that talking about your experience and perspectives regarding your children health behaviours will have any side effects. However, if you feel upset at all during the interview you may stop and take a break, or you can ask for the interview to be stopped.

10. What are the possible benefits in taking part?
10. Will I be paid for participating in the research?

You will receive a certificate and a £10 high street gift voucher as a ‘thank you’ for participating. Gift vouchers will be provided at the end of the interview and we will ask you to complete a form with your name and signature to confirm you have received the vouchers.

In addition, we can refund additional travel costs for you and 1 adult if you are able to provide evidence of the costs incurred e.g. a valid train, bus or car parking ticket.

11. How long will the study last for?

The duration of the study will be roughly 1 hour (40 minutes for the interview; 5 minutes for the questionnaire, 10-15 minutes for introductions and to ask questions). This may be longer or shorter depending on how much you would like to share in the interview and if you have any questions about the study.

12. Where will the study be conducted?

The study will take place at one of the organisation (the Rainbow heaven, Red British cross, rethink rebuild) or in a private room at The University of Manchester Oxford Rd, Manchester M13 9WL. Alternatively, they have the choice of telephone interviews.

13. What will happen to the results of the research study?

The results will be reported in professional publications and conferences (but participants will not be identified by name). The results may be presented to refugee organisations and agencies and other health and educational professionals and services and a report containing the results may be provided to them. You will not be personally identified in any reports or publications of the research.The results will also be reported in the PhD thesis produced by Maha Alsubhi. If you would like to be informed of the findings of the study, please contact Maha Alsubhi (details of which can be found on the last page).

14. What if something goes wrong?

If you have a concern about any aspect of the study, please contact **Maha Alsubhi** (lead researcher) or **DR Sarah Peters** (supervisor) in the first instance, details of which can be found on the next page.

If there are any issues regarding this research that you would prefer not to discuss with members of the research team and/or you would like to make a formal complaint about the conduct of the research, please contact the Research Governance and Integrity Team by either writing to 'The Research Governance and Integrity Manager, Research Office, Christie Building, The University of Manchester, Oxford Road,

Manchester M13 9PL', by emailing: Research.Complaints@manchester.ac.uk, or by telephoning 0161 275 7583 or 275 8093.

15. What do I do now?

Thank you for considering taking part in this research. If you are interested, please let Maha Alsubhi knows (details of which can be found on the next page). A researcher will then contact you with further information.

Contact details:

If you have any questions or would like to find out more about this study, please contact the lead researcher Maha Alsubhi or the supervisor of the study, details of which are below:

Mrs Maha Alsubhi

Room H24, Coupland I, Coupland Street, Oxford Road, Manchester, M13 9PL

University of Manchester

Manchester

Email: **maha.alsubhi@postgrad.manchester.ac.uk**

Dr Sarah Peters

University address: Room 1.25
Coupland 1 Building
Oxford Rd
Manchester M13 9PT
University email: sarah.peters@manchester.ac.uk
University telephone: +44 (0)161 275 2558

Dr Tracy Epton

University address: Room G7

Coupland 1 Building

Oxford Rd

Manchester M13 9PT

University email: tracy.epton@manchester.ac.uk

University telephone: +44 (0)161 3060455

Dr Joanna Goldthorpe

University address: Coupland 1 Building

Oxford Rd

Manchester M13 9PT

University email: joanna.goldthorpe@manchester.ac.uk

Appendix D. Study 2 Participants Consent Form

MANCHESTER 1824
The University of Manchester

Participant Consent Form

Title of Study: The experiences of refugee parents about health behaviour changes and its impact on weight among their young children

If you are happy to participate please complete and sign the consent form below:

Initials:

1. I confirm that I have read the participant information sheet (Version 2, Date 01/06/2018) for the above study.	
2. I have had the opportunity to consider the information and ask questions and had these answered satisfactorily.	
3. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving a reason and without detriment to myself. I understand that it will not be possible to remove my data from the project once it has been anonymised and forms part of the data set. I agree to take part on this basis.	
4. I agree to the interview being audio-recorded and transcribed (typed-up) by Maha Alsubhi.	
5. I agree that any data collected may be published in anonymous form in Maha ALsubhi's PhD thesis, academic books, reports or journals	
6. I agree that the researchers may retain my contact details in order to provide me with a summary of the findings for this study.	

7. I understand that my name will not be used and I will not be personally identified in any reports or publications of the research. I agree to the use of anonymous quotes from the interview	
8. I understand that data collected during the study may be looked at by individuals from the University of Manchester. I give permission for these individuals to have access to my data.	
9. I understand that there may be instances where during the course of the interview information is revealed which means that the researchers will be obliged to break confidentiality and this has been explained in more detail in the information sheet.	
10. I understand that data collected during the study may use for other studies conducted by the research team. I give permission for the research team to have access to my data.	
11. I agree to take part in this study.	

The personal information we collect and use to conduct this research will be processed in accordance with data protection law as explained in the Participant Information Sheet and the Privacy Notice for Research Participants**.**

________________________ ________________________ ____________

Name of Participant Signature Date

________________________ ________________________ ____________

Name of the person taking consent Signature Date

MANCHESTER
1824
The University of Manchester

Appendix E. Study 2 Topic Guide

Interview topic guide

As the interview is being conducted on a semi-structured basis, the questions listed below will serve as prompts for the interviewer. The exact order and number of the questions may change slightly as the interview progresses, and some further questions may be asked in order to pursue emerging themes. The following interview schedule will act as a guide for the researcher whilst conducting the interview.

Before you start:

- Thank the participant for agreeing to be interviewed. Explain you are a PhD student from the University of Manchester.
- Explain that the purpose of this research is to understand refugee parent's experiences about health behaviours changes (changes in diet and levels of physical activity) and their impact on weight among young children.
- Remind participants that
  - Everything they say in the interview will be confidential and they will not be able to be identified from any report arising from it.
  - It is OK to stop at any point or refuse to answer any questions during this interview.
- Check if they have any further questions at this stage.
- Check they are still OK for the interview to be audio recorded.
- Check that the recording device is working and turn it on.

Section 1 – Diet and parents feeding practices

1. What would you and your family usually eat in a typical day?
   - *Ask about ,Frequency, Preparation techniques*
   - *Describe how you shop for and prepare a typical dinner*

2. What are the changes that you have noaa1`ticed in your children's diet since you moved to the UK?
    - *Can you describe these changes (positive or negative)*
    - *How has the way you shop for and prepare a typical dinner changed?*
3. How has your child's diet or eating pattern changed since you moved to the UK?
    - *Children eat any snacks between meals*
    - *What kind?*
    - *How does this compare to how the child ate in the previous country?*
4. What comes to mind for you and your family when you think about eating a healthy diet?
5. How have the opportunities to eat a healthy diet changed for you and your family since you moved to the United Kingdom?
    - *Has it been easier or harder to eat a healthy diet since moving to the UK?*
    - *Probe for reasons why.*
6. What do you think are the factors that influence these changes in your children's diet?
    - *Probe present pictures that reflect the factors from the systematic review (e.g. weather, small houses, large supermarkets with lots of choices) to simulate the conversation.*
    - *What is the most important factor in your opinion?*
7. What do you think is your role in influencing your children's diet in the UK?
    - *Could you tell me how you feed your young children*
    - *What other factors influence your child's diet?*
8. Can you tell me about your experience feeding you children in the UK?
    - *What type of food does your child like to eat most?*
    - *What type of food does your child like to eat the least?*
    - *How do you decide when to stop feeding?*
    - *What type of food does your child like to eat most?*
    - *What type of food does your child like to eat the least?*
    - *How do you decide when to stop feeding?*
9. How would you influence your child's diet?
    - *Probe In which way?*

- *What do you do if your child does not want to eat? or wants junk food?*

10. What are the most difficult things about feeding your young children healthy food in the UK?
    - *Can you give me example? What are the strategies that you use if your children refuse to eat healthy food?*
    - *Probe: What are your nutritional concerns for you, your children?*
11. What do you think the impact of these changes in your children's diet has on their weight?
    - *Probe for example*
    - *Probe further for interesting responses.*

Section 2. Physical activity

We would like you to think about your daily activity:

12. What they think physical activity involves?
13. Tell me about a typical day when your child is active?
    - *Can you give me examples of what your child would do?*
    - *How that might be different than your own country?*
14. Tell me about a typical day when your child is sedentary?
15. Has your child's activities changed since moving to the UK?
16. What are the changes that you have noticed in your children's level of physical activity since you moved to the UK?
    - *Has they become more or less active.*
    - *What do you think are the factors that influence these changes in your children's physical activity?*
    - *What might influence that?*
    - *Probe present pictures that reflect the factors from the systematic review (e.g. weather, small houses, large supermarkets with lots of choices) to simulate the conversation.*
17. What are the most difficult things about being physically active for your children? Your family?
    - *Focus on child- level*

- *Then move to the family-level barriers.*
- *Probe: What are your concerns related to physical activities for you and your children?*

18. How often do you spend time outdoors?
    - *What are the activities that you usually do with your children outdoors?*
    - *How important is being outdoors to you?*
19. How would you influence your child's physical activity? In which way?
    - *Probe can you give me example?*
    - *How does this differ from what you would do in your home country?*
20. What do you think is your role in influencing your children's physical activity in the UK?
    - *Could you tell me about a time when that happens*
    - *Do you go on family walk together?*
    - *Do you do outside activity with your children? How often?*
21. What other health behaviours have changed as a result of your re-settlement in the UK?
    - *How about their sleep?*
    - *Have you noticed any changes?*
22. When thinking about what's been talked about today, if you could do one thing that would improve physical activity and healthy eating in families in your community, what would it be?
    - *Try to identify the most important action steps that can be done by local residents.*

Appendix F. Study2 Ethical Approval

- **Ethics approval and consent to participate**

****Please ensure you read the contents of this message. This email has been sent via the Ethical Review Manager (ERM) system on behalf of the University of Manchester.****

Dear Ms Maha Alsubhi,

Thank you for submitting your amendment request on 01/08/2019 11:05 for project: 2019-6539-11570 ; entitled: Refugee parents' experiences of changes in child's health behaviour which has now been approved. Your documentation has been suitably updated to reflect the proposed changes, please ensure you use this documentation.

Please note that if you have submitted revised supporting documents to accompany your amendment request, the approved versions of these are listed in a table below.

□

Document Type	File Name	Date	Version
Additional docs	Maha Alsubhi risk assessment		2

We wish you every success with the research.

Best wishes,

Mrs Genevieve Pridham

Secretary to University Research Ethics Committee 2

APPROVED: UREC Amendment Ref: 2019-6539-11570 (Automatic Email from the UoM Ethical Review Manager (ERM) system)

donotreply@infonetica.net
الجمعة 02/08/2019 09:56 صباحاً
إلى: Tracy Epton; Joanna Goldthorpe; Sarah Peters; Maha Alsubhi
نسخة: urec2@manchester.ac.uk

Please ensure you read the contents of this message. This email has been sent via the Ethical Review **Manager (ERM) system on behalf of the University of Manchester.**

Dear Ms Maha Alsubhi,

Thank you for submitting your amendment request on 01/08/2019 11:05 for project: 2019-6539-11570 ; entitled: Refugee parents' experiences of changes in child's health behaviour which has now been approved. Your documentation has been suitably updated to reflect the proposed changes, please ensure you use this documentation.

Please note that if you have submitted revised supporting documents to accompany your amendment request, the approved versions of these are listed in a table below.

Document Type	File Name	Date	Version
Additional docs	Maha Alsubhi risk assessment		2

We wish you every success with the research.

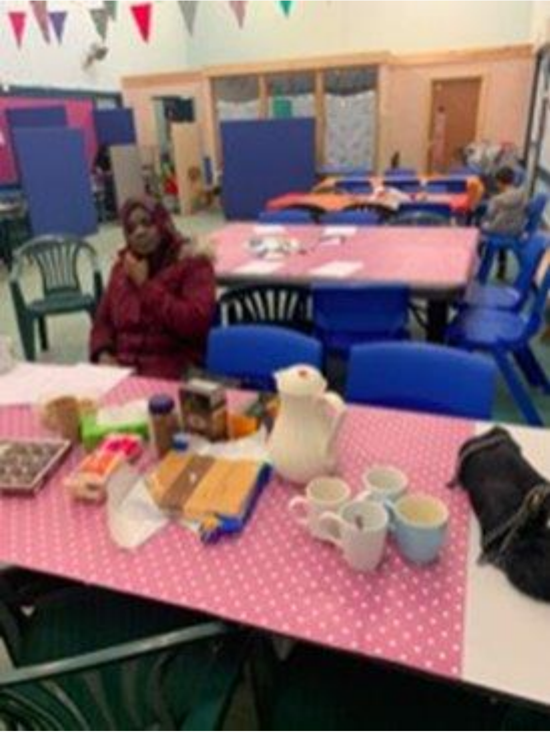
Best wishes,

Mrs Genevieve Pridham

Secretary to University Research Ethics Committee 2

Appendix G. Study 2 PPI activities and photos

AKTION



Appendix H Study 4 Participants Information Sheet

Participant Information Sheet

Title of Study: Culturally appropriate intervention targeting health behaviours among refugee families with young children

We would like to invite you to take part in a research study to see how practical and appropriate you think the " Be Healthy " programme is for your family, and your children's health behaviour. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for taking the time to read this.

1. Who will conduct the study?

I am Maha Alsubhi, a PhD student at the University of Manchester. I will be conducting the study under the close supervision of my academic supervisors: Dr Sarah Peters, Dr Tracy Epton and Dr Joanna Goldthorpe , all based at the University of Manchester.

2. What is the study about?

There are many families across the world forced to leave their homes and country of origin due to conflict. Some families resettle in more stable countries such as the UK. After their resettlement families and more specifically young children go through changes in their health behaviours such as eating patterns and levels

of physical activity as a response to the dramatic changes in their environment. Furthermore, these changes can have an impact on changes in their weight and health in general. We have developed a booklet (Be healthy) to help parents with young children making small changes to their lifestyle specifically focusing on snacking and sedentary behaviours to help them. The booklet will be alongside four discussion groups, text messages, and WhatsApp groups. The program will be over four weeks and each week we will have a one-hour discussion group and in the middle of the week, we will send you one text message to remind you of the discussion group. And you will also be added to the WhatApp group where you can share your experiences using the booklet. After the program we would like to interview you to find out how the booklet is used, whether it is useful, and how it can be improved and what you thought of the programme in general.

3. Why have I been invited?

You have been invited to take part in this study because you are a parent aged 18 or above to young children aged between 2-10 years old, have fled your country due to conflict and resettled in the UK. You will have been given this form because you are interested in taking part in the study.

4. What will I be asked to do if I take part?

If you decide to take part, you will be:

- Asked to complete an online form to say that you agree to take part (a consent form).
- Invited to taking part in (Be healthy) program over four weeks which will comprise of:
    - Booklet
    - Online zoom meeting (group discussion) every week.
    - A weekly text message to remind you about the group discussion.
    - WhatsApp group.
- After completing the program you will be invited to an interview which will be online (e.g. zoom meeting).

- You will be asked to complete a short online questionnaire about you.
- Asked to take part in an interview about your experiences:
    - The interview will be one-to-one between you and Maha Alsubhi.
    - The interview is expected to last around 1 hour, but may be longer or shorter depending on how much or little you would like to share.
    - You will have the opportunity to take breaks at any time you wish.
    - You do not have to answer any questions that you feel uncomfortable with.
    - There will be an opportunity at the end of the interview for you to ask any questions.
    - The interview will be video and audio -recorded.

5. What will happen to my personal information?

In order to undertake the research project we will need to collect the following personal information/data about you:

5. Contact details (name, contact number, email address)
6. Demographic questionnaire (age, gender information)
7. Consent form
8. Interview data

After the research the researchers may retain your contact details in order to provide you with a summary of the findings for this study.

Data generated from the intervention (discussion group and WhatsApp group) will be stored until the end of the project for participants as you are entitled to a copy of their data whilst you retain it. However, Data from the discussion groups and WhatsApp groups will not be recorded for analysis. The conversation will be deleted at the end of the project. All Participants' names and numbers will be hided and not shown to everyone. You will be told what kind of things to post and what to avoid posting. Finally, the conversation will be regarding the booklet and eating habits without mentioning the name of their children or anybody else. Data will not be disclosed to any person outside of the research team and this will be communicated clearly by the researchers to participants. In the discussion groups/ WhatsApp group you will be informed

that you should not disclose the identity of others in the group or information shared by others in the group to anyone outside of the group and consent to understanding this and agreeing to adhering to this will be obtained.

6. What are my rights regarding my personal information?

You have a number of rights under data protection law regarding your personal information. For example, you can request a copy of the information we hold about you, including audio recordings. This is known as a Subject Access Request. If you would like to know more about your different rights, please consult our "Privacy Notice for Research Participants" at http://documents.manchester.ac.uk/display.aspx?DocID=37095. If you would like to know more about your different rights or the way we use your personal information to ensure we follow the law, please consult our Privacy Notice for Research.

If you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, University of Manchester, Oxford Road, M13 9PL. They are based at the University of Manchester and we will guide you through the process of exercising your rights. You also have a right to complain to the "Information Commissioner's Office", Tel 0303 123 1113.

6.1 Under what legal basis are you collecting this information?

We are collecting and storing this personal identifiable information in accordance with UK data protection law which protect your rights. These state that we must have a legal basis (specific reason) for collecting your data. For this study, the specific reason is that it is "a public interest task" and "a process necessary for research purposes".

7. Will my taking part in this study be kept confidential?

Yes, the information you provide in the study will be confidential to the study researchers (mentioned in question 1). All personal information from the interview will be removed and your name will be replaced with a code (e.g. Participant 1). Quotes from your interview may be used in written reports or conferences, but no names or identifiable information will be included.

In the event that there are concerns about your safety or the safety of others, the researcher has a legal duty to break confidentiality. In instances, there is a possibility that individuals from the University may have access to your information. This will only be to review the study information for auditing and monitoring purposes or in the event of an incident.

8. What happens if I do not want to take part or I change my mind?

Taking part is entirely voluntary. It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to complete a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself. However, it will not be possible to remove your data from the project once your interview has been typed up and anonymised as we will not be able to identify your specific data. This does not affect your data protection rights.

Please also note that it is essential to your participation in the study that interviews are video and audio-recorded. Therefore, to participate, you must be comfortable with the recording process at all times. However, you are still free to stop recording at any time and your data will be removed, if you wish.

9. What are the possible side effects of taking part?

We do not believe that talking about your experience regarding the appropriateness and practicalities of the intervention will have any side effects. However, if you feel upset at all during the interview you may stop and take a break, or you can ask for the interview to be stopped.

10. Will I be paid for participating in the research?

You will receive a certificate and a £10 high street gift voucher as a 'thank you' for participating. Gift vouchers will be sent by post after the interview.

11. How long will the study last for?

The duration of the study will be roughly over five to six weeks. You will spend around 5 minutes for the questionnaire and consent form. The Be healthy programme will be over the four weeks and will include 1 hour each week for the discussion group, the time you spend on the booklet and the WhatsApp group. After the programme there will be a 1 hour interview. This may be longer or shorter depending on how much you would like to share in the interview and if you have any questions about the study.

12. Where will the study be conducted?

The programme and interview will be online (e.g. zoom meeting).

13. What will happen to the results of the research study?

The results will be reported in professional publications and at conferences (but you will not be identified by name). The results may be presented to refugee organisations/agencies or other health and education professionals/services. You will not be personally identified in any reports or publications of the research. The results will also be reported in the PhD thesis produced by Maha Alsubhi. If you would like to be informed of the findings of the study, please contact Maha Alsubhi (details of which can be found on the last page).

14. What if something goes wrong?

If you have a concern about any aspect of the study Dr Sarah Peters (supervisor) in the first instance, details of which can be found on the next page.

If there are any issues regarding this research that you would prefer not to discuss with members of the research team and/or you would like to make a formal complaint about the conduct of the research, please contact the Research Governance and Integrity Team by either writing to 'The Research Governance and Integrity Manager, Research Office, Christie Building, The University of Manchester, Oxford Road, Manchester M13 9PL', by emailing: research.complaints@manchester.ac.uk or by telephoning 0161 306 8089.

If you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, The University of Manchester, Oxford Road, M13 9PL at the University and we will guide you through the process of exercising your rights.

You also have a right to complain to the Information Commissioner's Office about complaints relating to your personal identifiable information Tel 0303 123 1113

15. What do I do now?

Thank you for considering taking part in this research. If you are interested, please let Maha Alsubhi know (details of which can be found on the next page). A researcher will then contact you with further information.

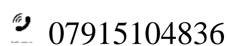
Contact details:

If you have any questions or would like to find out more about this study, please contact the lead researcher Maha Alsubhi or the supervisor of the study, details of which are below:

Mrs Maha Alsubhi

Room H29, Coupland I, Coupland Street, Oxford Road, Manchester, M13 9PL University of Manchester. Manchester

Email: maha.alsubhi@postgrad.manchester.ac.uk



07915104836

Dr. Sarah Peters

Coupland I, Coupland Street, Oxford Road, Manchester, M13 9PL University of Manchester. Manchester

sarah.peters@manchester.ac.uk

Appendix I. Study 4 Participants Consent Form

MANCHESTER 1824
The University of Manchester

Participant Consent Form

Title of Study: Culturally appropriate intervention targeting health behaviours among refugee families with young children

If you are happy to participate please complete and sign the consent form below:

Initials:

1. I confirm that I have read the participant information sheet (Version 2, Date 4/07/2021) for the above study.	
2. I have had the opportunity to consider the information and ask questions and had these answered satisfactorily.	
3. I agree to taking part in a WhatsApp group that forms part of the intervention (where my phone number will be shown but I can anonymise my name). The content of the group will not be saved beyond the life of the intervention and will be deleted by the researcher.	
4. I agree to take part in online discussion groups that form parts of the intervention. These will not be recorded or analysed.	
5. I agree to the interview being audio and video recorded and transcribed (typed-up) by Maha Alsubhi.	
6. I understand that there may be instances where during the course of the interview information is revealed which means that the researchers will be obliged to break confidentiality and this has been explained in more detail in the information sheet.	

7. I understand that my name will not be used and I will not be personally identified in any reports or publications of the research. I agree to the use of anonymous quotes from the interview	
8. I agree that the researchers may retain my contact details in order to provide me with a summary of the findings for this study.	
9. I agree that any data collected may be published in anonymous form in Maha ALsubhi's PhD thesis, academic books, reports or journals	
10. I understand that data collected during the study may be looked at by individuals from the University of Manchester, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my data.	
11. I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving a reason and without detriment to myself. I understand that it will not be possible to remove my data from the project once it has been anonymised and forms part of the data set. I agree to take part on this basis.	

The personal information we collect and use to conduct this research will be processed in accordance with data protection law as explained in the Participant Information Sheet and the Privacy Notice for Research Participants.

Name:

Date:

Appendix J. Study 4 Topic Guide

Semi-structure topic guide

1. **Affective attitude**

- How were you first introduced to the "Be healthy" intervention?
- How did you find using the booklet? In the group / on own?
- How well did you understand what you needed to do?
- What did you think about the length?
- What might make using it easier?
- What did you think about the discussion group every week?
- What did you think about the WhatsApp group? Content?
- What might make using it more useful?

2- Burden

- How easy/ difficult was it to use the booklet?
- Any issues using the booklet?
- What features of the booklet were helpful/ burdensome?
- What action did you need to take in order to use the booklet?

3- **Ethicality**

- How did you feel about using the booklet? Happy to use again?
- Who might benefit the most

- How did you feel about the suggested goals?
- How did you feel about the If- Then Plans? Was it useful?

4. **Intervention Coherence**

    - Why do you think you were offered to join " Be healthy" program?
    - What else is important to management?
    - What do you think the aim of the booklet was?

5- Opportunity costs

- How does "Be healthy" programme fit in with your normal daily/nightly routine?
- What have you changed to enable you to use the booklet? Attend the discussion group? Participate in WhatsApp group?
- How has the programme affected your children's (snacking , levels of sedentary behaviours)? Nature of change ?

6- Perceived effectiveness

- How useful did you find the booklet?
- What, if anything, did it add to the course?
- How has the booklet affected your motivation to initiate behaviour change ?
- Were any new techniques adopted and how did they help?

7- **Self-efficacy**

- How self-confident were you in your ability to initiate the change before "Be healthy" programme ?
- What support did you need/ from whom?

- How self-confident are you now about initiate change/achieve your own goals after"Be healthy" programme?
- How do you feel now in relation to the change you made in (snacking and sedentary behaviour)?

Appendix K. Study 4 WhatsApp group protocol

Discussion group Protocol

When	**What**	**Who**
Before 1st session	Invitation letter and patient information sheet (PIS) sent to facilitators by email. Consent taken a minimum of 24 hours after PIS received.	The researcher
session 1	Introduce booklet and provide information on health behaviours Understanding goal setting and setting realistic goals. Encourage to discuss with the group and share their experience. Set up WhatsApp group for parents	The researcher
Session 2	Provide information about sedentary behaviours and the negative consequences of these behaviours. Encourage to discuss with the group and share their experience. Encourage parents to identify barriers to the reduction of sedentary behaviours and discuss ways the parents could overcome them. Set new goal for following week for sedentary behaviour.	The researcher
Session3	Revisit goal. Discuss with the group if it was reache. Provide information to the parents on the appropriate number, proportion, ingredients, and timing of snacks.	The researcher

	Encourage parents to identify barriers to reducing snacking, providing healthy options. Evaluate examples of healthy snacks from their culture and decide whether or not they should be considered healthy Set new goal for following week for snacking. Set new goal for maintain the change	
Session 4	Revisit goal. Discuss with the group if it was reached Providing information on how to maintain the behaviour change Empower parents to gain control over the snacking and eating behaviours exhibited by their children.	The researcher

Research Governance,

Ethics and Integrity 2nd

Floor Christie Building

The University of Manchester

Oxford

Road

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9PL

Email:

research.ethics@manchester.ac.u

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10/09/2021

Dear Ms Maha Alsubhi, Dr Sarah Peters, Dr Tracy Epton, Dr Joanna Goldthorpe

Study Title: Culturally appropriate intervention targeting health behaviours among refugee families with young children University Research Ethics Committee 1

I write to thank you for submitting the final version of your documents for your project to the Committee on 09/09/2021 14:57. I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form and supporting documentation as submitted and approved by the Committee.

COVID-19 Important Note

Please ensure you read the information on the Research Ethics website in relation to data collection in the COVID environment as well as the guidance issued by the University in relation to face-to-face (in person) data collection both on and off campus.

A word document version of this guidance is also available.

Please see below for a table of the title, version numbers and dates of all the final approved documents for your project:

Document Type	File Name	Date	Version
Additional docs	The use of WhatsApp		1
Additional docs	PISArabic 2021		2
Additional docs	Consent Form Arabic		2
Additional docs	Topic Guid Arabic 2021		2
Additional docs	maha letter		1
Additional docs	translation certificate		1
Additional docs	WhatsApp group protocol33		1
Default	topic 33		3
Default	Discussion group Protocol 33		1
Default	Demographic questionnaire.docx19.33		3
Distress Protocol/Debrief Sheet	risk protocol.docxupdated final33		3
Lone Worker Policy/Procedure	Maha Alsubhi risk assessment (33		3

Additional docs	Maha A4 Booklet v2 Arabic)		1
Data Management Plan	DMP14	06/07/2021	2
Participant Information Sheet	PIS2021 final3333	08/09/2021	4
Additional docs	Maha A4 Booklet v3	09/09/2021	3
Additional docs	financial guarantee	09/09/2021	1
Consent Form	Participant Consent Form Final 44	09/09/2021	4
Advertisement	Be healthy Advert (final)	09/09/2021	4
Additional docs	letter to ethics committeeFinal sep2021	09/09/2021	4

This approval is effective for a period of five years however please note that it is only valid for the specifications of the research project as outlined in the approved documentation set. If the project continues beyond the 5 year period you will be required to submit a new ethics application.

If you wish to propose any changes to the methodology or any other specifics within the project, including the dates of data collection, an application to seek an amendment must be submitted for review. Failure to do so could invalidate the insurance and constitute research misconduct.

You are reminded that, in accordance with University policy, any data carrying personal identifiers must be encrypted when not held on a secure university computer or kept securely as a hard copy in a location which is accessible only to those involved with the research.

Reporting Requirements:

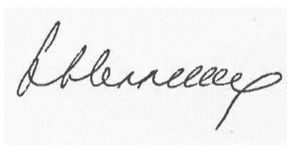
You are required to report to us the following:

1. Amendments: Guidance on what constitutes an amendment
2. Amendments: How to submit an amendment in the ERM system
3. Ethics Breaches and adverse events
4. Data breaches
5. Notification of progress/end of the study

Feedback

It is our aim to provide a timely and efficient service that ensures transparent, professional and proportionate ethical review of research with consistent outcomes, which is supported by clear, accessible guidance and training for applicants and committees. In order to assist us with our aim, we would be grateful if you would give your view of the service that you have received from us by completing a **UREC Feedback Form**. Instructions for completing this can be found in your approval email.

We wish you every success
with the research. Yours
sincerely,



Ms Kate Hennessy

Secretary to University Research Ethics Committee 1

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Session 4	Revisit goal. Discuss with the group if it was reached Providing information on how to maintain the behaviour change	The researcher

	Empower parents to gain control over the snacking and eating behaviours exhibited by their children.	