



# **Identifying Socio-Cognitive Beliefs of Eating in Moderation in Adults in the UK and Jordan**

A Thesis Submitted for the Degree of Doctor of Philosophy

By

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## ABSTRACT

This thesis aims to understand and influence the socio-cognitive beliefs towards moderate eating in adults in the UK and Jordan, to aid public health interventions for obesity. It begins with a systematic review identifying key factors in healthy eating habits, focusing on intrapersonal elements like self-efficacy and risk perception. The research then dives into qualitative and quantitative studies in the UK and Jordan to specifically explore beliefs about eating in moderation. It utilizes the "I-change model" as a theoretical framework. The goal is to provide tailored information for public health programs in these countries, targeting beliefs specific to their populations. The thesis concludes by discussing the contributions of each study, finding overarching themes for future research, and the importance of intervention mapping in designing effective public health programs.

The thesis uncovered several key findings. In the UK and Jordan, beliefs and perceptions about healthy eating, particularly eating in moderation, varied significantly. The research highlighted the importance of socio-cognitive factors like self-efficacy and risk perception in shaping these beliefs. It also revealed cultural differences in attitudes towards obesity and eating habits. The results from both countries provided valuable insights for designing targeted public health interventions, emphasizing the need for culturally sensitive approaches in promoting healthier eating habits. These findings contribute significantly to understanding the complex interplay of socio-cognitive factors in dietary behaviors.

## DECLARATION

*I declare that this dissertation is the original work of the undersigned and that no portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.*

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# CHAPTER 1. INTRODUCTION

## 1.1. Global Public Health Concern: The Obesity Epidemic

Obesity, a global crisis acknowledged by the World Health Organisation (WHO) as a significant illness and a major epidemic, presents an escalating public health crisis affecting the population of all ages. Its effects extend beyond personal well-being, as it significantly exacerbates long-term ailments such as heart disease, type 2 diabetes, and hypertension. By 2030, nearly half of all adults worldwide may be overweight or obese if the current rate of obesity prevalence continues (Kelly et al., 2008). The WHO has identified obesity as a key non-communicable disease (NCD), reflecting its widespread and critical impact on global health (WHO, 2023). Furthermore, obesity is increasingly being recognised as a societal issue, influenced by various social and environmental factors (WHO, 2021).

The negative impact of obesity extends beyond physical health concerns; it similarly affects individuals' mental health and overall self-satisfaction. People are often reluctant to seek support due to societal perceptions towards body weight. On the other hand, public figures, seen as role models, can have an effect on their self-esteem and easily persuade them to follow trendy diets (Sarwer & Polonsky, 2016). Those diets frequently result in inconsistent outcomes of recurring cycles of weight gain and loss, again highlighting the complexity of managing body fat. Modifying dietary habits, reducing high-sugar beverage intake, adopting a balanced eating plan, and adjusting macronutrient distribution are essential steps in obesity management (Koliaki et al., 2018). Lifestyle changes, guided by healthcare professionals, including psychologists and nutritionists, can significantly improve physical and mental well-being. Similarly, cognitive-behavioural therapy and mindfulness methods, improve perspective on food and body image, consequently promotes sustainable weight loss (Alamout et al., 2020).

There is a substantial financial burden of obesity on healthcare systems. The direct medical costs associated with obesity include expenses for treating health conditions, known to be obesity-related, such as diabetes, cardiovascular diseases, and

musculoskeletal disorders (Tremmel et al., 2017). Other than treatment, they take an increasingly significant proportion of hospital occupancy and outpatient clinical appointments, which result in longer waiting times and decreased efficiency. Additionally, indirect costs, such as productivity loss and work absences, further strain healthcare systems and the economy. The economic impact of obesity goes beyond healthcare costs and affects various sectors, including education, transportation, and employment. The health economics of obesity further highlights the need for preventive measures and interventions that can alleviate the financial strain on healthcare systems (Ananthapavan et al., 2014).

To address the complexities surrounding obesity, this thesis aims to address this pressing issue by exploring the socio-cognitive determinants of eating in moderation among adults in the UK and Jordan. Specifically, the overarching research question guiding this investigation is: What are the key socio-cognitive beliefs that influence healthy eating and eating in moderation in these two distinct cultural contexts? By identifying the most salient beliefs and determinants that predict eating behaviors, this study aims to inform the design of culturally sensitive, theory-driven public health interventions tailored to the unique needs of these populations. The subsequent objectives of this research will provide actionable insights that not only contribute to existing literature but also lay the groundwork for future digital health tools aimed at promoting healthier eating habits and combating obesity effectively.

This thesis employs a sequential mixed-methods research design, which integrates both qualitative and quantitative approaches. This design will allow for a comprehensive exploration of the socio-cognitive beliefs influencing healthy eating and eating in moderation among adults in the UK and Jordan. The initial phase will involve a systematic review of existing literature to identify key themes and knowledge gaps. Following this, qualitative studies will delve deeper into culturally specific beliefs and perceptions related to eating behaviors. The quantitative phase will then aim to quantify the prevalence and strength of these beliefs, ultimately guiding the development of culturally tailored public health interventions.

## **1.2. Past and present Understanding of Obesity**

Obesity has been a prevalent issue in human societies for centuries. The earliest known record of obesity dates back to ancient Egypt, where hieroglyphics depict individuals with signs of obesity. In ancient Greece, Hippocrates recognised and wrote about obesity as a medical disorder (Haslam, 2016). However, it was not until the 20th century that the modern understanding of obesity began to materialise. In the 1920s and 1930s, researchers and healthcare professionals started to identify obesity as a significant public health concern, closely linked to various chronic diseases such as diabetes and heart disease (Balke & Nocito, 2013). The first attempt at considering obesity as an issue by the WHO was in 1997, where they convened a brief meeting in Geneva, Switzerland following the development of a comprehensive plan by the International Obesity Task Force (James et al., 2001). Since then, the understanding of obesity has evolved significantly over time due to ongoing research efforts by scientists around the world (Haslam, 2016; Malomo & Ntlholang, 2018).

In recent years, there has been increasing emphasis on tailored interventions that consider the socio-cultural context of different populations. Researchers and health professionals recognise the need to address the underlying psychological, social, and environmental factors influencing obesity, rather than focusing solely on physical health outcomes. This understanding has led to the development of intervention models that are more culturally sensitive and targeted, ensuring that public health strategies resonate with specific populations (Caballero, 2007; Swinburn et al., 2019).

## **1.3. Epidemiology of obesity: Europe and Middle East**

Obesity rates have risen sharply in both Europe and the Middle East, contributing to significant public health challenges in these regions. In Europe, the 2022 WHO European Regional Obesity Report raised alarms, noting that one-third of children and over 60% of adults in the region are now classified as overweight or obese. The UK stands out with one of the highest obesity rates, where 25% of adults are classified as obese and 35% are overweight (Agha & Agha, 2017; Baker, 2024). These high rates are linked to

sedentary lifestyles and increased consumption of processed foods, both of which are heavily influenced by urbanization and modern living habits.

The Middle East has also seen a rapid increase in obesity rates. According to a report by World Obesity Federation (WOF), approximately 30% of adults are classified as obese in the region (*World Obesity Federation - Obesity*, 2016). For example, in the latest stats from the Global Obesity Observatory, men in Jordan were found 24% obese and 29% overweight, and women were 40% obese and 28% overweight. A similar study documented the increase in obesity rates was evident over a period of 10 years (Badran & Laher, 2011; Khader et al., 2008) This increase coincided with increased rates of diabetes, dyslipidemia as well as hypertension in Jordan (Ajlouni et al., 2020).

Obesity rates have increased as a result of the COVID-19 epidemic and the restrictions that went along with it negatively influencing people's eating decisions. A systematic review has shown that the COVID-19 pandemic significantly increased the prevalence of obesity, and that poor eating habits, sedentary lifestyles, and physical inactivity are prevalent risk factors for obesity. The same study showed that one important risk factor for obesity during the epidemic is the rise in bad eating habits (Nour & ALTINTAŞ, 2023). In 2020, during the COVID-19 pandemic, evidence from the UK Intensive Care National Audit and Research Centre (ICNARC), showed a disproportionate prevalence of obesity in patients admitted to hospital intensive care units (Richards-Belle et al., 2020). Similarly, being overweight or obese is associated with an increased risk of hospitalisation, severe symptoms and mortality from COVID-19.

#### **1.4. Exploring unhealthy eating behaviours**

Unhealthy eating behaviors are defined as patterns of food consumption that bear harmful consequences on health and well-being (Morales & Berkowitz, 2016). These include frequent consumptions of unbalanced diets, highly processed, or energy-dense foods that do not supply the necessary nutrients. Socio-cognitive factors, such as personal beliefs, social norms, and environmental influences, generally guide the development of eating behaviors that foster habitual poor dietary choices (Story et al., 2008; Sleddens et al., 2015). Persistence of this behavior over time is often accompanied by weight gain,

sometimes unconsciously. The lack of balanced food intake and sustaining such behaviors result in weight gain, sometimes unconsciously. Similarly, unhealthy eating behaviors might also include overconsumption of sugary snacks, processed foods high in saturated fats and sodium, and low intake of fruits, vegetables, and whole grains. Cultural perceptions of portion sizes, meal frequencies, and emotional relationships with food further shape these behaviors (Lopez et al., 2017; Sobal & Hanson, 2017). One such study, which controlled for necessary factors, came up with 3 behaviors most significantly associated with weight gain. These were inadequate meal planning, frequent fast-food intake, and eating while watching television (mindless eating). When multiple poor behaviors exist simultaneously, their correlation to weight gain shows stronger relevance (León-Muñoz et al., 2016). For this reason, the promotion of public awareness and subsequent establishment of guidelines on the same becomes highly relevant. Public health campaigns and interventions that target specific socio-cognitive barriers are especially important for addressing these behaviors in a culturally sensitive way and reversing this trend (Kreuter et al., 2003; Langellier et al., 2013). This is because of low intake of plant-based foods and too much availability and excessive consumption of sugar, salt, and fat, as reported in the European Union countries' EURO Nutrition - WHO, 2020. This becomes common in developing chronic diseases like diabetes, cardiovascular diseases, and certain types of cancers. It is highly advisable that fruits and vegetables should form part of the usual dietary intake to prevent the likelihood of cardiovascular and oncological diseases. Inadequate intake of these foods has been linked to increased rates of mortality. It has been estimated that 17% of deaths in the European Union on average is due to poor nutrition (Pomerleau et al., 2003). Given the strong link between diet and mortality, interventions need to focus on both increasing the availability of healthy food options and reshaping perceptions and attitudes toward food (Smith et al., 2015; Sobal & Hanson, 2017). Healthy lifestyle-promoting activities are those designed to reduce the incidence and impact of diseases that considerably burden society through the identification and reduction of unhealthy eating habits.

From these findings, it can be considered that those with higher education levels and women tend to consume larger amounts of vegetables and fruits on a day-to-day basis.



A good example of this practice is set by sportspersons who advocate healthful eating through educational media (Meng et al., 2018; Merle, 2018). These findings suggest that education and awareness may be potent promoters of healthier eating behaviors and point to the need for targeted interventions, which reach populations with lower access to education or health resources. This clearly depicts the importance of starting social marketing and community-based interventions in terms of promoting healthy eating habits. This will require prioritizing of public health programmes and education to address these issues and improve the general well-being of the people (Walls et al., 2011). However, for these interventions to be effective, they should address the socio-cultural and cognitive barriers that generally impede people from changing to healthier dietary habits (Sleddens et al., 2015; Kreuter et al., 2003).

### **1.5. Eating in moderation**

A particular aspect of maintaining a healthy diet involves the idea of "Eating in moderation" (Hess, 2022). Adopting a balanced approach to eating has shown to be advantageous as it allows for better control and restriction of high-calorie foods, which is a promising tactic in the fight against weight gain. Research shows that adopting a moderate approach results in sustained reductions in energy intake without causing increased feelings of hunger (Kral et al., 2004).

Overweight and obesity result from an imbalance in energy intake and expenditure (*What Causes Obesity & Overweight?- NICHD*, 2021). Increased consumption of high-energy foods and larger portion sizes contribute significantly to this excessive energy intake (Ello-Martin et al., 2005; Rolls et al., 2007; B. A. Swinburn et al., 2004). Additionally, various studies have suggested that eating more frequently may also play a significant role in this regard. In light of the above findings, it is important to highlight the significance of moderate eating as part of healthy dietary habits (Hess, 2022). This involves choosing smaller portion sizes, moderating meal frequency, and selecting lower-energy-dense foods instead of consuming excessive amounts of high-calorie food portions (Dijker, 2019; Haines et al., 1999). Cultural and socio-cognitive factors, such as perceptions of what constitutes a "proper meal" or how food is linked to social gatherings, can impact an

individual's ability to practice moderation. In certain cultures, for example, overeating during celebratory events or prioritizing large portion sizes is seen as a sign of hospitality, which can challenge the practice of eating in moderation. These beliefs and social norms need to be considered when promoting moderate eating through public health campaigns (Lopez et al., 2017; Sobal & Hanson, 2017).

Moderate eating allows for a flexible and sustainable dietary pattern rather than strict dieting (Rolls et al, 2009). Research shows that adopting a moderate eating approach results in sustained reductions in energy intake without causing increased feelings of hunger (Kral et al., 2004). Education about nutrition, portion control, and balanced meals can greatly help reduce rates of obesity. Ensuring access to nutritious foods among communities is another crucial step in addressing this global public health challenge (Story et al., 2008; Sleddens et al., 2015).

Being aware and understanding own risk behaviour is an important step in the maintenance of balance attitude to food. Therefore, interventions should focus on increasing people's awareness to ensure that they develop healthier habits (Walthouwer et al., 2015).

In order to promote eating in moderation through interventions effectively, it is essential to understand the key socio-cognitive factors influencing eating behavior. Tailored interventions that address these barriers, while considering cultural and social contexts, can improve the likelihood of success in encouraging moderate eating habits (Kreuter et al., 2003; Noar et al., 2007).

## **1.6. Public Health Interventions and Gaps in the UK and Jordan**

Despite numerous public health interventions aiming at obesity reduction, large gaps persist both in the UK and Jordan. These arise almost entirely from the lack of tailored approaches addressing socio-cognitive determinants and cultural factors that shape eating behaviours. This section will review existing interventions, dietary shifts, and gaps that still remain in both regions.

### ***1.6.1. Existing Public Health Interventions***

Public health interventions in both countries have focused on fostering an understanding of healthy eating while encouraging physical activity. Of these, the "Tackling Obesity" campaign in the UK and the National Framework of Action on Obesity Prevention in Jordan stand out as government-led strategies designed to combat the rising prevalence of obesity (Public Health England, 2020; WHO, 2019).

Among these are calorie and food labeling schemes, such as the "traffic light" labels used in the UK, and community-based health promotion schemes aimed at promoting healthier eating. Most have, however, focused on children and adolescents and have tended to overlook adult populations. In addition, many of these interventions pay little regard to the cultural norms and socio-cognitive factors that influence eating behavior, which seriously limits their long-term impact.

### ***1.6.2. Shifts in Eating Habits in the UK***

Over the last few decades, there have been major changes in UK eating habits, driven by powerful forces such as urbanization and globalization, along with diverse socio-economic forces. Such changes have led to a rise in the intake of processed food, a booming culture of fast food, and increased portion sizes—all posing a challenge that contemporary public health interventions are trying to surmount.

This increased reliance on convenience foods, particularly in low-income communities that already face barriers to accessing options for healthy eating, translates into more high-calorie/low-nutrient diet intakes. Studies apparently show that people from disadvantaged socio-economic groups are more inclined towards the intake of unhealthy food items due to reasons associated with their cost and availability, further increasing dietary disparity (Obesity and Poverty, 2023).

These dietary shifts underline the failure of current interventions, usually based on generalized recommendations disregarding the complex socio-economic and cultural issues driving food choices in diverse communities.

### ***1.6.3. Dietary Shifts in Jordan***

Similarly, in Jordan, forces of urbanization and globalization, along with increased exposure to Western-style fast foods, have brought about a change in the way of eating. A once traditional Jordanian diet, filled with vegetables, legumes, and lean meats, is quickly being replaced by energy-dense and processed foods to contribute to the rising prevalence of obesity and its associated diseases.

Cultural factors significantly impact dietary practices in Jordan. One of the cornerstones of Jordanian culture is hospitality in the form of serving generous portions of food, which is mostly calorie-dense, to guests. These cultural norms are a major challenge to public health intervention that seeks to promote healthy eating since they often conflict with the traditional perceptions of food and hospitality (Tayyem et al., 2018; Khader et al., 2008).

While many community-based interventions have evolved, few in Jordan address cultural issues sensitively and challenge deeply held norms. Furthermore, like the UK, interventions in Jordan have largely focused on children and adolescents, leaving adults out of the picture.

### ***1.6.4. Existing Public Health Interventions***

While public health initiatives in the UK and Jordan have been improving, there are noticeable gaps that undermine the long-term effectiveness of these interventions. Another significant gap is that most programs predominantly focus on children and adolescents, hence the adult population gets less attention, leaving a considerable portion of the population without support for adopting healthier eating habits. Adults, all of whom have other demands in their lives, require tailored interventions that consider work-life balance and family responsibilities to be managed, which, in turn, impact food choice and the ability to fit physical activity into one's life.

Another major shortcoming in most of the current interventions is that they are not culturally sensitive. Public health campaigns in Jordan have been criticized for ignoring

the very deep-seated cultural food practices relating to hospitality; for example, serving large, calorie-rich meals at social gatherings. Similarly, in the UK, interventions might not fully consider the broader socio-economic determinants that shape dietary behavior; more so in the low-income communities where access to healthful foods might be minimal. These are the cultural and socio-economic barriers that need consideration in the design of more effective, context-specific interventions.

It is, in addition, often the socio-cognitive determinants—like individual beliefs, self-efficacy, and social influences that are poorly addressed in many existing interventions. Identification of these determinants, however, is of critical importance to facilitating long-term behaviour change. For instance, one's confidence levels toward changing to healthier eating patterns (self-efficacy) and the influence of family, friends, and wider social norms strongly determine food choices. Yet again, many interventions do not consider these factors and so are less effective at bringing about a change in behavior. By identifying and addressing these gaps, this thesis aims at providing a clearer understanding of the socio-cognitive beliefs that influence eating in moderation in both the UK and Jordan. The research will inform the development of interventions that are sensitive to beliefs, attitudes, and the socio-economic realities of adult populations in both countries and hence improve their potential for promoting healthy eating and reducing obesity.

### **1.7. Intervention Mapping: Designing Effective Public Health Interventions**

Intervention Mapping (IM) provides a systematic and theory-driven framework for the development of health promotion programs, ensuring that interventions are both evidence-based and tailored to specific populations. The first step of IM involves conducting a thorough needs assessment that includes the collection of detailed information on the health problem, the target population, and the environmental factors that contribute to the behavior in question (Bartholomew Eldredge et al., 2016). This needs assessment provides the foundation to understand the contextual realities of the target population, including cultural norms, socio-economic factors, and existing health behaviors.

Following the needs assessment, the IM process extends into the development of matrices of change objectives. These define what the specific behavioral and environmental changes an intervention should bring about and are strongly based on theoretical models of how behavior change occurs. Identification of the most important determinants that influence healthy eating and eating in moderation is done using the I-Change model, which is discussed later in this chapter. Matching these determinants to the intervention objectives ensures that the intervention is designed to effectively promote behavior change.

The next step in the IM process is the selection of theory-based methods and translation into practice: finding out strategies proved to work in similar contexts and adapting them to fit the particular needs of the target population. For example, in the context of this study, qualitative research conducted in the UK and Jordan highlights the specific socio-cognitive beliefs that influence eating behaviors in these regions. These insights are essential for developing culturally sensitive interventions that address both individual and environmental factors (Eldredge et al., 2016).

Following the needs assessment, the IM process continues with the development of matrices of change objectives. These matrices outline the specific behavioral and environmental changes that the intervention aims to achieve, and they are closely tied to theoretical models that explain how behavior change occurs. The I-Change model, which is discussed in detail later in this chapter, plays a pivotal role in identifying the key determinants that influence healthy eating and eating in moderation.

This thesis focuses on steps 1 and 2 of the framework, identifying key beliefs such as self-efficacy and social norms, and using these to create matrices of change objectives. These objectives are essential for mapping the relevant determinants to Behavior Change Techniques (BCTs), which are the evidence-based strategies designed to modify the identified beliefs and ultimately influence behavior. For example, findings from this research revealed that in Jordan, large portion sizes during family gatherings are a social norm that acts as a barrier to eating in moderation. Using IM, this belief could be addressed through BCTs such as social modeling, where culturally appropriate role

models demonstrate healthier portion sizes, or goal setting, which encourages individuals to set realistic, smaller portion targets for meals. By linking beliefs to BCTs through the logic model of change, this thesis provides actionable insights that inform future intervention design. This approach ensures that the socio-cognitive determinants identified in this study are translated into practical strategies tailored to the cultural contexts of the UK and Jordan.

## **1.8. Socio-Cognitive Determinants of Eating in Moderation**

Understanding the factors that influence eating behavior is essential in developing effective public health interventions. To explore these factors in depth, this thesis employs a sequential mixed-methods research design to gain a comprehensive understanding of the socio-cognitive determinants of healthy eating, specifically focusing on eating in moderation. This design involves a systematic review of existing literature, followed by a qualitative study exploring in-depth beliefs and perceptions, and concluding with two independent quantitative studies to quantify the prevalence and strength of those beliefs. This sequential approach allows for a deeper understanding of the phenomenon by first identifying key themes from existing literature, then exploring those themes in detail through qualitative interviews, and finally testing the relationships between identified beliefs and eating behaviors using quantitative methods.

The socio-cognitive determinants of eating in moderation involve a combination of psychological and social factors that influence individuals' decisions about their diet. These determinants help explain why certain individuals adopt healthier eating habits while others struggle to maintain moderation in their food intake. Drawing from Bandura's Social Cognitive Theory and Ajzen's Theory of Planned Behavior, we can identify key determinants:

1. **Attitudes toward Eating in Moderation:** People's beliefs about the outcomes of their eating habits—whether they perceive eating in moderation as beneficial for health—play a pivotal role. If individuals believe that eating in moderation will lead to desirable

outcomes such as weight control, disease prevention, or improved well-being, they are more likely to adopt this behavior (Sleddens et al., 2015; Story et al., 2008).

2. **Perceived Risk and Health Concerns:** Perception of risks associated with overeating or unhealthy diets, such as obesity and chronic diseases, strongly motivates individuals to alter their eating patterns. In populations like the UK and Jordan, cultural factors influence this perception—where in some cases, food is viewed more as a social connector, lessening the perceived health risks (Ragelienė & Grønhøj, 2020).
3. **Social Norms and Peer Influence:** Social pressures and the behavior of others around individuals can significantly influence dietary choices. In Jordan, for example, family gatherings or social expectations often revolve around large portion sizes or traditional high-calorie dishes. In the UK, on the other hand, eating habits may be influenced more by social media and perceptions of modern dietary trends (Stok et al., 2015; Al-Nuaimi et al., 2019). Peer influence and societal expectations, therefore, are crucial in either facilitating or hindering the practice of eating in moderation.
4. **Self-Efficacy:** The confidence that individuals have in their ability to control their eating habits is a key predictor of success. People with high self-efficacy are more likely to plan their meals, resist temptations, and persist in practicing moderation even when faced with challenges. For example, individuals who feel confident in preparing healthy meals or portioning their food appropriately tend to make better long-term dietary choices (Walthouwer et al., 2015).
5. **Cultural Perceptions:** In both the UK and Jordan, cultural perceptions of food play a significant role in shaping eating behavior. In the Middle East, particularly in Jordan, food is often closely linked with hospitality and social gatherings, which can result in overconsumption during events. On the other hand, in the UK, the ease of access to processed foods, coupled with time constraints, often leads to an increase in unhealthy eating habits (Khader et al., 2008).
6. **Environmental Cues:** The surrounding environment, including access to healthy food options and the availability of unhealthy, convenient food, also influences eating



behavior. In Jordan, urbanization has led to increased consumption of fast food, which contrasts with traditional, healthier dietary patterns. In the UK, busy lifestyles and the convenience of processed foods present similar challenges (Sobal & Hanson, 2017).

Overall, socio-cognitive factors such as risk perceptions, attitudes toward health, self-efficacy, and social norms are critical in understanding how individuals approach eating in moderation. Addressing these determinants is essential for developing targeted interventions that can promote sustained changes in eating behavior in both the UK and Jordan.

## **1.9. Factors Influencing Eating in Moderation**

The decision to engage in healthy eating specifically eating in moderation is influenced by a variety of factors, both internal and external. These factors are complex and intertwined, shaping individuals' eating behaviors across different cultural, social, and environmental contexts. By examining the broader determinants of eating behavior, we can understand the underlying challenges individuals face when attempting to adopt and maintain healthier diets.

### ***1.9.1. Internal Factors***

Internal factors refer to personal beliefs, motivations, and psychological processes that influence an individual's approach to eating.

- **Perceptions of Health Risks:** Awareness of the health risks associated with overeating and unhealthy diets is a critical motivator for adopting healthier eating behaviors. Research shows that individuals who perceive a higher risk of developing obesity-related diseases, such as cardiovascular disease and diabetes, are more likely to adjust their eating patterns (Sobal & Hanson, 2017). However, risk perception varies across cultural contexts, with some populations underestimating the dangers of poor dietary habits.

- **Self-Efficacy and Control:** A strong sense of self-efficacy—belief in one’s ability to regulate eating habits—has been shown to promote consistent moderation in food consumption. Individuals who feel they can control portion sizes, resist unhealthy foods, and make healthier choices are more successful in sustaining these behaviors over time (Walthouwer et al., 2015). This sense of control is crucial in overcoming temptations and navigating environments that offer limited healthy options.
- **Attitudes and Beliefs About Food:** People’s attitudes toward food, shaped by personal preferences, cultural beliefs, and past experiences, play a significant role in influencing eating behavior. For example, individuals who view healthy eating as a sacrifice or associate pleasure only with indulgent foods may struggle to practice moderation (Kim, 2016). Shifting attitudes toward the enjoyment of healthier foods is key to promoting long-term dietary changes.

### **1.9.2. Social Factors**

Social influences, including family, friends, and broader societal norms, exert a powerful impact on eating behaviors. These social factors often dictate what is deemed acceptable or normal in terms of food consumption.

- **Social Norms and Peer Influence:** The behavior of peers and family members significantly influences individual eating choices. In Jordan, for instance, traditional social gatherings often involve large, communal meals with rich, calorie-dense foods. Such cultural practices can perpetuate overeating and make it challenging to adopt moderation in eating (Al-Nuaimi et al., 2019). Similarly, in the UK, social norms around convenience eating and fast-food culture can undermine attempts to eat healthily (Stok et al., 2015).
- **Family Dynamics:** Family plays a crucial role in shaping dietary habits, particularly in collectivist cultures like Jordan. Parental influence, especially in childhood, has long-lasting effects on eating behaviors in adulthood. In the UK, family mealtimes and food availability at home are also determining factors in how individuals approach food (Ragelienė & Grønhøj, 2020).

### **1.9.3. Environmental Factors**

The environment in which individuals live, including access to healthy food options and the availability of unhealthy, convenient foods, also shapes eating behavior.

- **Food Accessibility:** In both the UK and Jordan, disparities in access to nutritious foods contribute to the challenge of eating in moderation. In lower-income areas, healthy foods are often more expensive and less accessible than highly processed, calorie-dense options. This food environment significantly influences dietary choices, especially in populations with limited financial resources (Merritt et al., 2021).
- **Urbanization and Globalization:** In Jordan, rapid urbanization and the growing influence of Western diets have led to a shift from traditional, plant-based diets to more processed and high-calorie foods. This dietary shift has been linked to rising obesity rates, as traditional eating patterns are replaced by convenience-oriented diets (Haddad et al., 2021). Similarly, in the UK, global food trends and the proliferation of fast-food outlets have contributed to an increase in unhealthy eating behaviors (Sobal & Hanson, 2017).
- **Cultural Beliefs and Practices:** Culture plays a pivotal role in shaping food choices and behaviors. In Jordan, food is often associated with hospitality and generosity, leading to large portion sizes and overconsumption during social events. In the UK, cultural trends such as 'eating on the go' and the popularity of fast food have created an environment that encourages unhealthy eating habits (Khader et al., 2008). Addressing these cultural beliefs is essential in promoting moderation in eating. Understanding the interplay of these internal, social, and environmental factors is crucial for designing effective interventions that promote healthy eating and eating in moderation. Tailoring public health strategies to address these factors, while taking into account cultural nuances, can significantly improve the success of dietary interventions in both the UK and Jordan.

## **1.10. The I-Change Model as a Theoretical Framework**

The Integrated Change Model (I-Change Model), provides a valuable framework for understanding how socio-cognitive factors influence health behaviors, such as eating in moderation. This model integrates elements from several established theories of behavior change, including Ajzen's Theory of Planned Behaviour, Bandura's Social Cognitive Theory, and Prochaska's Transtheoretical Model. It presents a structured approach to analyzing how people become aware of health risks, develop motivation to change their behaviors, and ultimately take action (De Vries et al., 2005; Rejeski & Fanning, 2019). The I-Change Model is divided into three main phases that individuals progress through when attempting to modify their behavior:

### ***1.10.1. Pre-Motivational Phase***

In this phase, individuals become aware of health risks and the benefits of making healthier choices. Key determinants of behavior in this phase include knowledge, risk perceptions, and cues to action. For instance, individuals must be aware of the risks associated with overeating and poor nutrition (e.g., increased risk of obesity and related diseases) before they can begin considering changes to their eating habits (Vries et al., 2014).

In both the UK and Jordan, public health campaigns can play an essential role in raising awareness about the risks of unhealthy diets and the importance of moderation. However, the effectiveness of these campaigns depends on individuals' personal knowledge and their perception of the relevance of these risks to their own lives. Understanding how populations perceive risks in different cultural contexts is crucial for tailoring effective interventions.

### ***1.10.2. Motivational Phase***

Once individuals are aware of the risks, they move into the motivational phase, where they contemplate whether or not to change their behavior. In this phase, determinants such as attitudes, social influences, and self-efficacy come into play. Attitudes toward

healthy eating, shaped by cultural norms and personal preferences, determine whether individuals are willing to make changes (Cheung et al., 2021). Social influences, including family and peer groups, also play a role, as individuals are more likely to adopt healthy behaviors if they receive support from their social networks (Sleddens et al., 2015). For example, in Jordan, traditional social gatherings emphasize the consumption of large meals, which can create cultural resistance to moderation in eating. In contrast, in the UK, fast-food culture and convenience eating may undermine the desire to engage in healthy eating habits. In both cases, interventions must target these socio-cultural influences to effectively promote behavior change.

### ***1.10.3. Post-Motivational Phase***

The final phase involves translating motivation into action. In this stage, factors such as action planning, goal-setting, and self-efficacy are crucial in determining whether individuals can implement and sustain changes in their behavior. Here, individuals may face practical barriers, such as a lack of access to healthy foods or difficulty maintaining consistency in their dietary habits (Vries et al., 2014).

Behavioral interventions need to support individuals in this phase by helping them develop concrete strategies to overcome barriers and maintain their commitment to healthier eating. Action planning involves setting realistic goals and identifying coping strategies for challenging situations, such as social events that encourage overeating. In Jordan, interventions might focus on modifying traditional meal practices to promote moderation, while in the UK, interventions might target reducing the appeal of convenience foods and increasing awareness about portion control.

The I-Change Model is particularly relevant in the context of this research, as it provides a structured approach to understanding how beliefs, attitudes, and social norms shape eating behavior. By identifying the key determinants of eating in moderation, this model can help guide the development of culturally sensitive interventions in both the UK and Jordan.

By applying this model, the present study seeks to explore how these determinants differ across populations and cultures, providing valuable insights into how to tailor public health interventions to address the unique needs of different communities. Understanding where individuals are in the pre-motivational, motivational, or post-motivational stages allows public health practitioners to design targeted interventions that resonate with individuals' specific experiences and barriers to change (Walthouwer et al., 2015; Kasten et al., 2019).

## **1.11. Research Aim and Objectives**

### *Overarching Aim*

The overarching aim of this thesis is to explore the socio-cognitive determinants of eating in moderation among adults in the UK and Jordan, using the I-Change Model as the guiding theoretical framework. By identifying the most salient beliefs and determinants that predict eating in moderation, this study seeks to inform the design of culturally sensitive, theory-driven public health interventions tailored to these two distinct populations.

### *Research Aims*

To identify the most salient socio-cognitive beliefs and determinants of eating in moderation among adults in the UK and Jordan, and to understand how these beliefs influence behavior across different cultural contexts. The findings will provide actionable insights to develop targeted public health interventions and lay the groundwork for future digital health tools.

### *Research Objectives*

1. To identify the most salient socio-cognitive beliefs that influence eating in moderation among adults in the UK and Jordan, focusing on key constructs such as risk perception, attitudes, social influences, and self-efficacy.

2. To determine which socio-cognitive determinants of the I-Change Model predict eating in moderation behavior in adults in the UK and Jordan.
3. To compare the socio-cognitive beliefs and determinants of eating in moderation across the UK and Jordan.
4. To provide recommendations for the design of culturally sensitive, theory-driven public health interventions.
5. To illustrate the value of combining systematic review, qualitative, and quantitative methods in developing a comprehensive understanding of socio-cognitive determinants of eating behavior.

The interconnectedness of the data collection aspects in this research is essential for a comprehensive understanding of the socio-cognitive factors influencing eating in moderation. The study employs a sequential mixed-methods design, commencing with a systematic review that first synthesizes current knowledge on the facilitators and barriers to eating in moderation. This review will effectively lay the groundwork for the subsequent qualitative phase. In this qualitative phase, semi-structured interviews will delve deeper into culturally specific beliefs and perceptions towards eating in moderation that are shared by adults in both the UK and Jordan. This qualitative exploration will then inform the development of questionnaires for the quantitative studies, ensuring that the constructs measured are culturally sensitive and relevant to the populations under study.

Ultimately, this study's findings will serve as a critical foundation for the design and implementation of culturally sensitive digital interventions aimed at promoting healthier eating behaviors in both the UK and Jordan. By identifying the salient socio-cognitive beliefs and determinants influencing eating in moderation, this research will inform the development of tailored strategies that resonate with the unique cultural and social contexts of each population. Furthermore, these findings will not only contribute to the existing body of knowledge but also pave the way for future research that explores the efficacy of digital interventions in modifying eating behaviors and ultimately reducing obesity rates in distinct cultural settings.

## CHAPTER 2. GENERAL METHODOLOGY

### 2.1. Designing Health Interventions

To design health interventions, it is essential to understand when and why people engage in health-promoting or health-harming behaviours, such as whether or not they choose to smoke (Huver et al., 2006), be physically active, engage in unhealthy eating habits or drink alcohol (Cheung et al., 2020; Martínez-Montilla et al., 2020). Over the past several decades, researchers have drawn on theoretical models from various social science disciplines, including psychology, sociology and anthropology, to generate hypotheses about what factors might influence behaviour (ie, hypothesise about behavioural determinants). Socio-cognitive models are a class of theoretical models that describe how behaviour is thought to develop in people, through a dynamic interaction of social and cultural factors, and how behavioural determinants might interact to potentially alter a behaviour (ie, affect behaviour change) (Kasten et al., 2019; Vries et al., 2005). For instance, influential examples of socio-cognitive models include Bandura's Social Cognitive Theory, which emphasises constant reciprocal interaction between factors internal to the person (eg, sense of personal efficacy or capacity to achieve a goal) and environments (ie, social pressures) (Tadayon Nabavi & Bijandi, 2012). This model characterises the lifelong bidirectional process of learning, through which the individual's behaviour (eg, how long they pursue a goal) continuously shapes their environment (peers' perceptions of them and their skill) just as much as it is shaped by the environment (eg, others' expectations of their perseverance effort (Davis et al., 2014; Glanz & Bishop, 2010).

Bandura's Social Cognitive Theory is an increasingly popular socio-cognitive model. Individual behaviour is seen as resulting from the interrelationship of personal factors – such as self-efficacy beliefs (that people have about their own abilities) – and environmental factors (such as social pressures around the ability to carry out a specific action). In addition, the behaviour itself can act back on these personal and environmental factors. Thus, behaviour continually interacts with other personal and environmental factors. Environmental factors, or the situation, are defined as all external things that



outside the individual constitute the social and physical context in which the person functions (Cheung et al., 2021; Farwan, 2011). Those surroundings could support, or not support, certain behaviours. Therefore, understanding change in behaviour requires consideration of key social influences such as role models.

Personal factors deal with an individual's ability to learn from personal experiences or from simply watching others' behaviour (Dovey et al., 2017). This latter ability is called vicarious learning, or indirect learning through observation (eg, whistling after watching someone shape their lips and blow the air). Behavioural factors deal with the ability to perform the behaviour; this could be the capability to do something, like making a whistling gesture, or it could be the intellectual ability to make and to comprehend the whistle.

Bandura made the point that: Learning occurs in a complex social context involving reciprocal interactions among the person, the environment and behaviour. To this end, reciprocal determinism suggests that all of these three factors mutually affect one another, a point that underlines the notion that learning is not something that is passively received by the human being (Tadayon Nabavi & Bijandi, 2012).

Three key factors from the Social Cognitive Theory (Heffernan, 1988) that significantly influence an individual's behavior and have gained widespread attention within the field of behavioral science are:

1. Outcome expectations pertain to an individual's anticipations regarding the results or impact of their actions.
2. Modeling involves observing others engaging in a specific behavior (an environmental factor), which leads to emulation when the behavior yields positive results. Conversely, modeling can also lead to avoidance of the behavior when negative outcomes are anticipated.
3. Self-efficacy denotes an individual's confidence (a personal factor) in their ability to carry out a particular behavior.

Another 'social cognitive' model – a theory of reasoned action by (Fishbein and Ajzen, 1975) – is often the second most popular model for predicting individuals' behavioural intention and behaviour, and many hybrid models emerged later (Albarracín et al., 2001). The intention – in the sense of a readiness or prerequisite for the actual behaviour – is predicted by attitudes towards the behaviour – which in turn is the perceived consequences resulting from a specific behaviour, and their value – and the subjective or social norms regarding the behaviour – which is the perceptions about others' evaluation of one's behaviour when performing it (Hu et al., 2021). Attitude refers to perceived beliefs about behavioural consequences (eg, 'if I exercise, I will have a fit body') and social norms refer to perceived beliefs about others' behaviour (eg, 'my romantic partner believes I should play sports more often') (Hu et al., 2021). Later, people added Bandura's concept of efficacy from Social Cognitive Theory as 'perceived behavioural control' in Theory of Planned Behaviour.

The Health Belief Model (HBM) emerging in the 1950s another influential model for understanding health behaviour, often used in public health interventions and widely published until today. The temporal view on inducement mechanisms suggests that HBM aims to explain and predict health behaviours based on attitudes and perceptions of risk. HBM proposes that behavioural change happens due to persons' perceptions of threat and net benefits (Jones et al., 2015). In turn, perceived threat and net benefits depend on their levels of perceived susceptibility, severity, benefits and perceived barriers. Perceived susceptibility poses the likelihood of an individual being susceptible to a condition. Perceived severity is about the seriousness of the condition and its consequences. Perceived benefits is about the confidence individuals hold about the effectiveness of health behaviour for reducing risk or severity. Perceived barriers – an individual's concerns about drawbacks associated with the health behaviour – should be subtracted from their perceived benefits. For example, private health insurance is often associated with the fear about being left alone with large medical bills (drawback). Cues to action, either internal or external (such as pain), could trigger the likelihood of behavioural change by tapping into the perceived threat. In later models, self-efficacy was further added to an extended HMB (Mao et al., 2023).

## 2.2. Integrated-Change Model

By employing a critical analytical approach to examine the interactions between components, integrating behavioural theories and models has the potential to generate novel theories that offer enhanced value, rather than just combining existing theories. Through the integration of Bandura's Social Cognitive Theory (Bandura, 1986), the Health Belief Model (HBM) (Abraham & Sheeran, 2015), the Theory of Planned Behavior (Ajzen, 1991), Prochaska's Transtheoretical Model (Prochaska & Velicer, 1997), and Goal Setting Theory (Locke & Latham, 2002), the I-Change Model, also known as the Integrated Model for Motivational and Behavioral Change, advanced these concepts. The I-Change Model is shown in Figure 2, which divides behavior change into three stages: pre-motivation, or awareness; motivation; and post-motivation, or action.

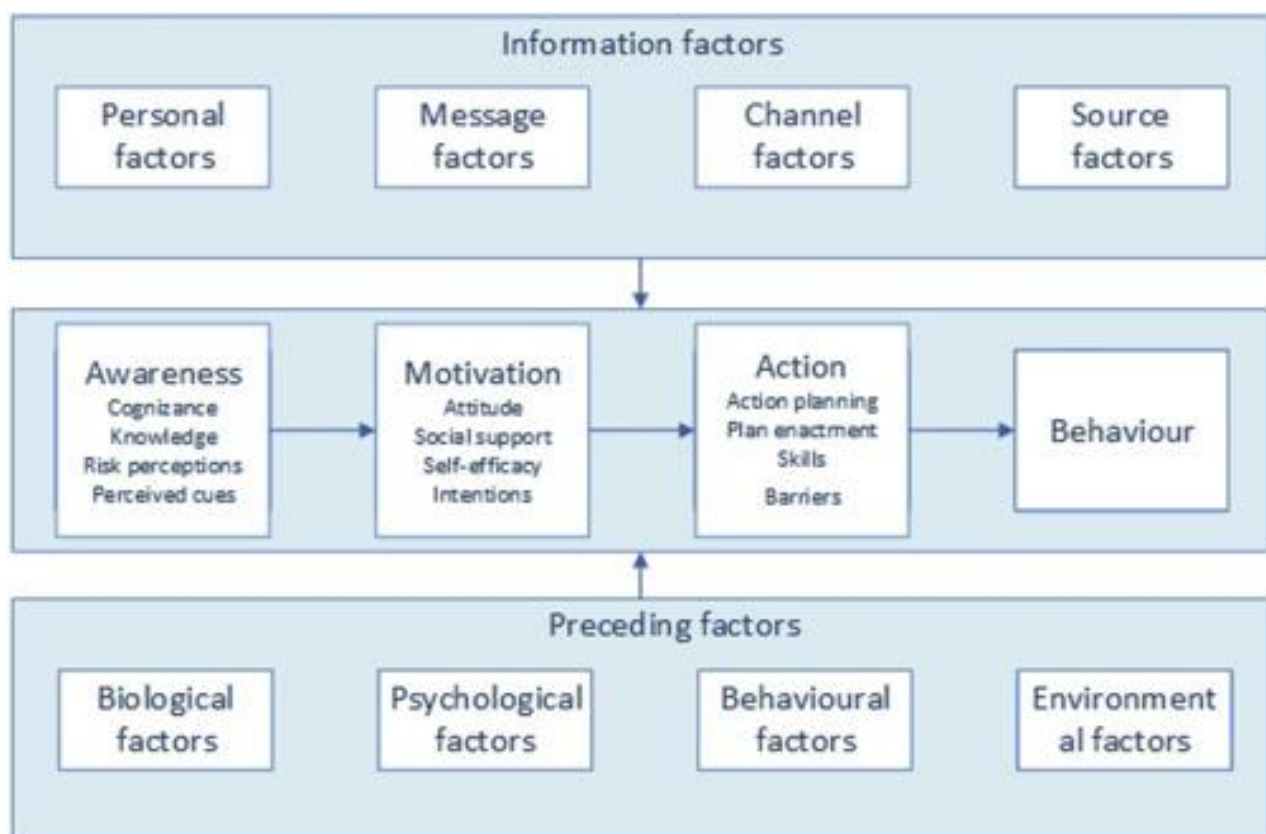


Figure 1. I-Change Model

For instance, in order to initiate a health-promoting behaviour such as establishing an exercise routine, people pass through an awareness stage first. The awareness of a certain behaviour (eg, sedentary lifestyle) is deciphered when people become aware of not only the threats of the undesired behaviour but also the advantages of taking the appropriate health behaviour. Awareness can be characterised by myriad elements ranging from knowledge, to risk perception and perceived cues. Knowledge refers to gaining knowledge about the facts about the targeted behaviour and how to conduct the desired health behaviour. Risk perception is the appraisal of susceptibility to health hazards as well as the gravity of health threats of the current behaviour. Awareness can be initiated by an internal-generated cue (eg, feeling fatigued or tired) or an external-generated cue (eg, a friend discussing with you how her exciting her new exercise regimen is).

The next step towards changing a behaviour is to increase motivation – that is, the intention to change (Ashton et al., 2017). Motivation encompasses more general motivational factors for a behaviour. Examples are attitudes, social influences and self-efficacy. Attitude refers to how the person appraises the consequences of a health behaviour. Social influences pertain to how a person evaluates others' views on the behaviour, and self-efficacy refers to how the person appraises her own ability to perform the behaviour under various circumstances.

From motivation to action, the next step concerns the move from intentions to doing, which means turning intention into behaviour by relying on self-efficacy, action plans and plan enactment. Action planning includes both action-oriented behaviours related to the focal health behaviour and preparatory planning refers to plans to promote the effort necessary for the change attempt. Coping planning involves strategies to handle problems related to the accompanying situation and interfere with sustaining the now necessary health behaviour.

Action is likely to fall short of behaviour change even when motivation, or intentions, are high. The action phase focuses on designing specific action or coping plans and enactment of these plans. But planning is not enough – people also need the skills to turn

their plans into actions and the skills to overcome barriers to behaviour change (Ashton et al., 2017).

### **2.3. Digital health and tailoring**

Having established a better understanding of the underlying mechanism to health behavioural change, this opens the opportunity to explore digital health (dHealth) and how to apply this knowledge to create tailored dHealth interventions. Health is a broad term that encompasses the use of digital technology to promote healthcare, which is referred to as dHealth. It can encompass a wide range of applications, from static websites to interactive apps. dHealth is also a health-promotion strategy aimed at reducing morbidity and mortality that stems from deleterious lifestyle behaviours. The importance of dHealth is that it could potentially be cost-saving because, in theory, it provides a software-based and easily scalable solution at a relatively low cost (Cheung, Wijnen, et al., 2017; Lustria et al., 2013). Such dHealth interventions have proven effective in promoting physical activity, alcohol consumption, condom use, food consumption (Cheung, Wijnen, et al., 2017) and tobacco smoking (Lustria et al., 2013). These dHealth interventions can also potentially reach a wide range of people worldwide given the pervasiveness of the Internet.

A key question for digital health in this regard relates to the design of such methods: how can interventions be designed to achieve the best possible outcome? After all, it's clear that not all digital health methods are equal. Choices therefore have to be made carefully. The core of the problem is the ability to see there are indeed meaningful differences in such nuanced levels of effectiveness. A particularly important method with this characteristic is called computer tailoring, and it is considered one of the promising methods in digital health (Taylor et al., 2017).

Computer tailoring is a type of intervention design where information messages are carefully calibrated for each user through digital technology. The basic concept driving this intervention design is targeting dHealth intervention outcomes by using computer-tailoring technologies to deliver individually tailored and motivating health information that varies as a function of user characteristics, such as age, gender, attitudes and risk

perceptions. Precision in this method, notably in tailored dHealth, potentially holds promise for further improving the effectiveness of digital health interventions (Cheung, Schwabe, et al., 2017).

An analysis of dHealth systematic reviews of improved health behaviour reveals that interventions of theory-driven, patient-centred design enjoying greater success (Taylor et al., 2017). The underlying mechanism for the effective behaviour-modification of dHealth programmes is well understood and explicated in the I-change Model: A systematic review from the Netherlands nicely illustrates the point. The I-Change Model was the logic of change underlying the dHealth interventions that are the focus of the review. Interventions operating with this logic of change demonstrated their suitability for tackling many different health behaviours (Cheung, Wijnen, et al., 2017).

## **2.4. Pragmatic methodology to design digital health**

When developing a computer-tailored intervention, it can be helpful to follow a specific stepwise process. De Vries and Brug, and Dijkstra and De Vries have written publications providing detailed accounts of these processes (de Vries & Brug, 1999; Dijkstra & De Vries, 1999). A personalised intervention should be based on a theory of behaviour change that has been shown to be effective (see Health Promotion (Gemert-Pijnen et al., 2011; Kay Bartholomew Eldredge, 2016) for stepwise guidelines about developing a scientifically sound health promotion plan, and start by performing a thorough assessment of needs). Before brainstorming any feasible solutions, the first step is to perform a careful analysis of the problem.

1. Which behaviours go together with health problems? (People who follow a diet rich in saturated fats tend to go over the limits of salt intake.)
2. Who is the target group and who has an interest in the topic?

These include large constructs such as the Behaviour Change Wheel and Intervention Mapping, which provide valuable guidance for how to approach the development of an intervention in general terms. Intervention Mapping, for example, also contains detailed

guidance on how to develop the needs assessment as a component of the intervention. Given certain factors – such as limited time and money or resources, and a well-defined health behavioural goal – the decision to be more systematic and structured might not be the best choice.

There are three main stages to tailoring a theory-driven targeted dHealth intervention:

1. Selecting an appropriate theoretical framework
2. Identifying the goals and objectives of the tailored dHealth intervention
3. Identifying key cognitions or beliefs in the targeted audience
4. Developing a programme with content and an algorithm. This approach provides a step-by-step, systematic, and scientific roadmap to developing dHealth interventions, which can even be done when time and resources are limited.

## **2.5. Choosing the theoretical model**

The factors to be addressed will be driven by the selection of the theoretical model. For example, the Health Belief Model (HBM) does not explore social norms, social modeling, and social support. Similarly, the Theory of Planned Behavior lacks coverage on action planning. Therefore, it is important to know which theoretical model will be most suited to comprehending and modifying a specific health behavior.

### ***2.5.1. The computer-tailored intervention: Goals and objectives***

Subsequent decisions involve selecting the focus of the computer-tailored intervention in relation to the overarching objective and the particular behavioural determinants to be tackled. If the aim is to target individuals who are already motivated to change, then the focus can then shift towards determinants like self-efficacy, action planning, and skills enhancement. However, distinct objectives are essential when the intention is to raise awareness, motivate individuals, or a combination thereof.

### ***2.5.2. Identifying Salient Beliefs***

Given the powerful influence of beliefs on behavior, it is essential to investigate the beliefs of the target population regarding each specific health behavior of interest. Not all beliefs hold equal relevance for every health behavior, and certain beliefs may be more central depending on the behavior in question. Thus, the identification of pertinent beliefs, along with their underlying theoretical constructs, and their relationship to the actual health behavior becomes crucial.

## **2.6. Literature Research**

In cases where time and resources are limited, the initial stage involves conducting an exhaustive literature review to identify existing knowledge about the target population's beliefs related to the behavior in question. If previous research has been conducted in a similar population or context, a review of this literature might yield relevant findings that can provide details about the beliefs and behaviors of the target population, offer leads for intervention, and suggest beliefs associated with behavior change. Despite the potential wealth of knowledge that previous research provides, the literature is not always well-suited to provide rich counseling material specific to the setting of the intervention and might necessitate the second and third stages of formative research: qualitative and then quantitative research.

### ***2.6.1. Qualitative Research: Examining Relevant Beliefs***

Delving into potential key beliefs requires us to examine what the target population believes based on the various determinants of behavior. Qualitative methods such as focus groups or interviews are employed for this purpose, with initial explorative, open-ended questions derived from the I-Change Model. Interviews can be used to discover beliefs that might be very important. These extracted beliefs become the basis for choosing which determinants of behavior to include in the selected behavioral change model, promoting healthy behavior.



### ***2.6.2. Quantitative Research: Identifying Salient Beliefs***

In the third step, attention turns to identifying those beliefs that impact health behavior to the greatest extent. Quantitative tools, mostly survey work, can then identify these key beliefs. The coaches foment beliefs during the qualitative phase and turn these into questions for surveys. Take the 'I believe that eating balanced meals will help me maintain a healthy weight' example from before, and now turn it into a 7-point scale, with 7 representing 'agree strongly' and 1 representing 'disagree strongly'. Using a statistical technique such as analysis of covariance (ANCOVA (ANCOVA - *Science Direct*, 2001)) can then be utilized to identify significant differences between people who engage in healthy behaviors and those who don't, thus identifying those beliefs that are most crucial to explaining these differences.

### ***2.6.3. Develop the Program Content and Algorithm***

The intervention's content can then be created in accordance with these principles. Planning how intervention components can alter these beliefs in order to facilitate the targeted behaviour change is part of the intervention design process, along with outlining the rationale of change (the theoretical pathway, variables, and the specific beliefs to be addressed).

### ***2.6.4. General Concept and Intervention Components***

The design is created by engagement with all relevant parties, including the target population and implementation teams. Stakeholder involvement contributes to the adoption and implementation of the intervention. The early stages of the planning process involve dialogue in the planning group about macro-level issues, such as overall health, and micro-level issues, such as individual habits. Initially, participants think about the broad outline of the intervention – the main pieces or components that an intervention will have, and the order in which these components will be delivered.

## **2.7. Create Change Objectives and Align Them with Change Methods**

An important step is to assess each salient belief as a change target and to tie change strategies to specific objectives. Salient beliefs serve as a platform to develop program objectives. Strategies to realize those objectives are determined by those objectives. If a salient belief identified by a quantitative study, as 'I think that regular exercise helps me manage stress,' regarded as a change aim, the designer does the next work using a belief identified as a change aim. The next work is how to convince individuals that regular exercise reduces stress. To achieve this, the designer uses several behavior-change strategies, such as arguments stating the logical facts about the benefits of regular exercise and the drawbacks of a sedentary lifestyle.

## **2.8. Application of Behavioral Change Techniques**

Following the identification of salient beliefs, the next step decisions revolve around customizing selected behavior change approaches to address salient beliefs in the target individuals. Tailorable dHealth interventions require a strategic determination of how to implement the outlined process steps. The creators must establish a method for delivering these techniques, whether through videos, text messages, or interactive games. Those shaping our tailored dHealth interventions typically align health messages with the chosen tailoring approach. Once messages are developed, the program can then customize them based on users' responses (e.g., their level of agreement with key concepts). This tailoring process relies on algorithms written by a health professional proficient in code and implemented by a programmer fluent in coding techniques. The algorithms usually employ an 'if-then-else' logic to provide the user with the relevant message based on their response. The 'if' represents the state of the belief (e.g., perceiving high stress due to sedentary habits), the 'then' suggests an intervention (e.g., incorporate regular physical activity), and the 'else' clause activates if the user doesn't meet the criteria for the 'then' logic offer. The tailoring process is refined by sequencing these questions according to the stages of change outlined in the I-Change Model.

## 2.9. Thesis Methodology Outline

In laying the foundation for this thesis, a comprehensive systematic review was conducted to identify the general facilitators and barriers influencing healthy eating behaviours among individuals classified as overweight and obese. This review included the intrapersonal, interpersonal and environmental factors. The systematic review served as the first step in exploring the highly complex scenery of factors underlying dietary decisions.

Based on the results of systematic review, this study opted for socio-cognitive approach to improve healthy eating behaviors. The use of a “health intervention mapping” approach sought to address the practices aimed at designing public health programs targeting overweight and obese individuals, based on their beliefs. This approach was created in order to customize interventions targeted at socio-cognitive factors, thus creating a specific strategy.

In order to explore in-depth specific beliefs and perceptions that were identified through a systematic review, a qualitative study was conducted. This qualitative study targeted adults in the UK and Jordan, with a focus on capturing cultural underpinnings that shape eating healthily, and eating in moderation. The rationale behind the choice to focus on these countries was the increasing rates of obesity, cultural specificity, literature gap in Jordan and opportunities for comparative analysis. Using semi-structured interviews, this study aimed to develop the details of individual beliefs concerning healthy eating and eating moderation in these unique cultural settings.

Being aware of the need to pinpoint beliefs with accuracy, a quantitative phase was introduced. Categorizing individuals into those who practice eating in moderation, and individuals who do not. The study sought to quantify beliefs related with this particular behavioral character. Cultural differences were considered in separate quantitative studies from the UK and Jordan. The questionnaire used in the quantitative study in the UK was developed based on the results of the qualitative study in the UK. Taking into account various cultural aspects, a Jordan-specific questionnaire was adapted from the

UK questionnaire based on the discrepancies identified during qualitative phase, so that each group reflected its uniqueness.

The study understood the effects of cross-cultural variations and therefore incorporated a way to control it. The goal of the study through separate UK and Jordan studies was to reveal salient beliefs specific for each population that could improve cultural interpretations of healthy eating and eating in moderation. The study obtained necessary ethical approval from the appropriate bodies in the UK and Jordan.

In summary, the study aims to be a useful guide for creating future health interventions that encourage healthier eating behaviours, specifically eating in moderation, especially in different cultural settings. By exploring the specific beliefs towards healthy eating and moderation in various cultures, the research sets the stage for targeted strategies. This detailed understanding helps in creating better public health initiatives addressing the widespread issue of obesity and promoting overall health.

# CHAPTER 3. SYSTEMATIC REVIEW: FACILITATORS AND BARRIERS TOWARDS HEALTHY EATING IN OVERWEIGHT AND OBESE ADULTS

## 3.1. Introduction

The surge in the prevalence of overweight and obesity over the past four decades has become a difficult global public health challenge, with projections indicating a potential doubling of the global obesity rate by 2030, missing the World Health Organization's 2025 target (WHO - Obesity, 2021; World Obesity Atlas 2022, 2022). This escalating health crisis not only affects individual health but also strains healthcare systems worldwide, leading to increased treatment demands for weight-related complications and non-communicable diseases (Rolling & Hong, 2016). The urgency to address unhealthy eating habits is highlighted by the increasing burden on global health resources (Forray et al., 2023).

High levels of overweight and obesity in specific regions, including the United States, the United Kingdom, Germany, the Czech Republic, and the Middle East (MENA), particularly among high-income adults, underscore the severity of the issue (Ng et al., 2014; WHO - Obesity, 2021). For instance, Kuwait recorded the highest obesity prevalence in the Middle East at 38% in 2016 (Statista - MENA Obesity by Country, 2016). This surge in obesity has led to a corresponding increase in health complications, emphasizing the critical need to address unhealthy eating habits (Brandhorst & Longo, 2019). Unhealthy nutrition practices are recognized as a major contributor to global disease and mortality (Hearty et al., 2007). To combat this issue, understanding the specific facilitators and barriers influencing healthy eating in overweight and obese adults is essential.

Targeting healthy eating habits emerges as a crucial, low-risk strategy for improving overall well-being and life expectancy (Walsh et al., 2009). The World Health Organization (2016) emphasizes the importance of a balanced diet, encouraging high consumption of fruits, vegetables, and whole grains while limiting intake of saturated fats, salt, and refined

carbohydrates (WHO - Obesity, 2021). Identifying facilitators and barriers to healthy eating is crucial for developing targeted interventions and policies to address the global obesity crisis.

Research indicates that both facilitators and barriers impact individuals' decisions to adopt healthy eating habits. Social norms, influenced by facilitators and barriers, play a role in encouraging or discouraging healthy habits (Wolfson et al., 2019). Barriers are factors or characteristics that hinder individuals from making healthy decisions, while facilitators promote or ease such decisions (Subramaniam et al., 2022).

Numerous studies have attempted to identify barriers preventing individuals from making healthy decisions, such as social influences associating unhealthy food with socializing and preferences for fast food due to taste and accessibility (Danaei et al., 2011; Larson et al., 2012; Robertson et al., 2014; Wolfson et al., 2019). Both facilitators and barriers are influenced by demographic, social, and individual aspects (Hearty et al., 2007). Despite the availability of qualitative and quantitative studies on this topic in people with obesity, this study aims to be the first systematic examination focusing on the facilitators and barriers to healthy eating in these populations, using the McLeroy model to categorize determinants into individual, interpersonal, and environmental factors (Hu et al., 2021; McLeroy et al., 1988).

Cultural differences play a significant role in influencing dietary habits, and understanding these variations provides insights into the unique needs of specific populations. Health communication interventions are most effective when tailored to the population (Cheung, Schwabe, et al., 2017), necessitating an understanding of cross-cultural differences in barriers and facilitators.

The primary aims of this systematic review are to comprehensively explore the available literature on the factors, both facilitators and barriers, influencing healthy eating behaviors in overweight and obese adults. Our focus is to gain a nuanced understanding of the recognized facilitators and barriers and discern which factors are considered pivotal in influencing dietary choices among overweight and obese adults.

To understand the factors affecting healthy eating behavior in overweight and obese adults, this review uses McLeroy's socio-ecological model (McLeroy et al., 1988). This model examines influences on dietary choices at three interconnected levels: intrapersonal, interpersonal, and environmental. Intrapersonal factors include characteristics of the individual and their behaviours and knowledge that influence health. Interpersonal factors look at formal and informal relationships with others that may shape social identities in an individual's life. This may include relationships with family, friends, and colleagues. The environmental level considers elements like access to food, economic conditions, and societal norms. By using this model, this review aims to systematically explore how these various factors shape healthy eating habits in overweight and obese adults.

Through this exploration, we aim to establish a foundational knowledge base that guides our subsequent investigation into the beliefs associated with these identified facilitators and barriers. Recognizing the importance of specific factors, we intend to delve deeper into understanding the underlying beliefs of individuals in these populations. The ultimate goal is to inform public health intervention programs with precise insights into the beliefs that drive or impede healthy eating behaviors.

In summary, our systematic review aims to (1) identify and categorize the existing facilitators and barriers to healthy eating in overweight and obese adults and (2) lay the groundwork for an in-depth examination of the beliefs associated with the identified determinants. This comprehensive approach is designed to provide valuable insights for the development of targeted public health interventions that address the specific beliefs of individuals in these populations, ultimately contributing to the effective management of the global obesity crisis.

## **3.2. Materials and Methods**

### ***3.2.1. Selection Criteria***

Inclusion criteria for the studies included in this review were as follows: (1) primary research published in peer-reviewed journals with full-text available in English; (2) focus

on adults aged 18 or older with a BMI of 25 kg/m<sup>2</sup> or higher (or more than 50% of the sample with a BMI of 25 kg/m<sup>2</sup> if the study did not exclusively include overweight or obese individuals), and (3) reporting on motives, barriers, or preferences related to healthy eating. In this review, facilitators were defined as any perceived reasons to increase and maintain healthy eating habits, while barriers were defined as any challenges reported by participants that hindered the initiation and maintenance of healthy eating behaviors, as described by Dao et al (Dao et al., 2019).

### **3.2.2. Search Strategy**

A number of electronic bibliographic databases (PubMed [MeSH terms], Scopus, Academic Search Complete, CINAHL Plus, APA PsycINFO, and SocINDEX) were searched using both controlled vocabulary (e.g. 'Healthy eating') and specific keywords (e.g. eat\*, health\* W/3 eat\*) from June 2021. Search terms were adapted for each database and combined using Boolean operators to narrow the results. A wide range of terms for healthy eating (e.g. healthy diet, healthy nutrition, healthy food, healthy eating habits, healthy meals and balanced nutrition) were combined with terms for obesity (e.g. obese, overweight, unhealthy weight, high BMI and adiposity) as well as terms used to describe facilitators and barriers (e.g. motivators and enablers, obstacles, challenges and difficulties).

The search terms were refined a number of times in order to optimise the selection of articles, without compromising with the sensitivity of the search in order to consider the vast number of articles published on the topic of healthy eating and obesity. The keywords can be found in the appendix. The searches covered the full range of publications in each database from the year 2008 up to 2021 (when the review was completed). The year 2008 was the year where the obesity rates worldwide had doubled. In 1980, 4.8% of men and 7.9% of women were obese; however, those percentages almost doubled to 9.8 percent of men and 13.8 % of women in 2008. Thereby, articles published before 2008 were less likely to reflect the lifestyles of the adults in the current environment (CASP Checklists - Critical Appraisal Skills Programme, n.d.). Full reports of potentially relevant studies identified from the literature search were obtained and classified (e.g., in terms of



specific topic area, context, research design and methodological attributes). No limits were applied to the search and methodological filters for study design were not used, as these reduce the sensitivity of searches (Downes et al., 2016).

### ***3.2.3. Selection of Studies***

All retrieved citations were imported into Mendeley software (v2.66.0), and duplicate records were removed. Two independent reviewers screened records against inclusion and exclusion criteria, first according to titles and abstracts, and then two independent reviewers screened the full-text papers of the selected abstracts. Disagreements were resolved by the third reviewer.

### **3.3. Data Extraction and synthesis**

A data extraction form was developed and piloted independently by two authors and modified accordingly. The reviewer then independently extracted key data which included: (Authors, year of publication, study title, sample size, study method, outcomes measured, study design and overall quality score). Data were collated, summarised, and reported using text and table (Table 1) and Table (2). The facilitators and barriers were classified using the socio-ecological model of McLeroy et al. (McLeroy et al., 1988), which involved interpersonal, intrapersonal factors, social factors as well as environmental factors.

**Table 1. Characteristics of the studies: Quantitative Studies**

Study	Sample Size	Gender	Country	Study Method	Outcomes Measured	Methodological Tool
AL Farwan, Wadha Mushabeb, 2011	302	F	Saudi Arabia	Quantitative (Cross-sectional)	Barriers to healthy eating	Structured Questionnaire
Abdulrahman O. Musaiger et al., 2014	530	M/F	Kuwait	Quantitative (Cross-sectional)	Barriers to weight maintenance	Pre-tested Questionnaire
L. Daniuseviciute et al., 2018	500	M/F	Lithuania	Quantitative (Cross-sectional)	Dietary behaviors	Food Frequency Questionnaire
L. Ashton et al., 2017	61	F	USA (African American)	Quantitative (Cross-sectional)	Barriers to healthy eating	Questionnaire
Mazzola et al., 2013	N/A	M/F	International (Workplace settings)	Quantitative	Barriers & Facilitators	Questionnaire
Mazzola et al., 2021	N/A	M/F	International (Workplace settings)	Meta-Analysis	Barriers & Facilitators	Questionnaire
Poobalan et al., 2014	N/A	M/F	International (Multiple settings)	Quantitative	Barriers & Facilitators	Questionnaire
Blake et al., 2014	450	M/F	USA (Low-income)	Quantitative (Cross-sectional)	Barriers & Facilitators	Structured Questionnaire
Chary A., 2010	128	M/F	USA	Quantitative (Cross-sectional)	Barriers & Facilitators	Pre-tested Questionnaire
Dobbins et al., 2017	46	F	Australia	Quantitative (Cross-sectional)	Barriers to healthy eating	Surveys

**Table 2. Characteristics of the studies: Qualitative Studies**

Study	Sample Size	Gender	Country	Study Method	Study Design	Outcomes Measured	Methodological Tool
Scott et al., 2020	100	M, F	Australia	Focus groups and interviews	Qualitative	Barriers and facilitators to healthy eating	Semi-structured interviews
Suplee et al., 2018	48	F	USA	Interviews	Qualitative	Facilitators and barriers to healthy eating	Semi-structured interviews
Salci MA, 2016	55	M, F	Belgium	Focus groups	Qualitative	Facilitators and barriers to healthy eating	Focus groups
Cardenas MK, 2014	18	M, F	UK	Focus groups	Qualitative	Barriers to healthy eating	Focus groups
Chary A, 2010	128	M, F	USA	Focus groups and interviews	Qualitative	Barriers and facilitators to healthy eating	Focus groups and interviews
Castro B., et al 2011	23	M, F	Belgium	Semi-structured interviews	Qualitative	Facilitators and barriers to healthy eating	Semi-structured interviews
Rodríguez-Morán M, 2015	128	F	USA	Semi-structured interviews	Qualitative	Facilitators and barriers to healthy eating	Semi-structured interviews
Dobbins et al, 2017	46	F	Australia	Focus groups and interviews	Qualitative	Barriers to healthy eating	Focus groups and interviews
Suplee et al, 2015	48	F	USA	Interviews	Qualitative	Facilitators and barriers to healthy eating	Interviews
Mazzola et al., 2021	23	M, F	USA	Semi-structured interviews	Qualitative	Facilitators and barriers to healthy eating	Semi-structured interviews

Study	Sample Size	Gender	Country	Study Method	Study Design	Outcomes Measured	Methodological Tool
Roman et al., 2021	30	M, F	USA	Semi-structured interviews	Qualitative	Barriers and facilitators to healthy eating	Semi-structured interviews
Melnyk et al., 2017	20	M	USA	Interviews	Qualitative	Both facilitators and barriers to healthy eating	Interviews
Mendonça R de D et al., 2019	22	M/F	Brazil	Focus groups and interviews	Qualitative	Barriers to and facilitators for adherence to nutritional intervention: consumption of fruits and vegetables	Focus groups and interviews

**Table 3. Characteristics of the Mixed Methods Studies**

Study	Sample Size	Gender	Country	Study Method	Study Design	Outcomes Measured	Methodological Tool
Lim et al., 2019	210	Male, Female	Singapore	Interviews (Qualitative) + Surveys (Quantitative)	Mixed Methods	Barriers to Healthy Eating, Facilitators	Interviews, Surveys
Louey et al., 2021	300	Male, Female	Multiple High-Income Countries	Feedback (Qualitative) + Surveys (Quantitative)	Mixed Methods	Barriers to Healthy Eating, Facilitators	Surveys, Qualitative Feedback
Kerins et al., 2018	150	Male, Female	Ireland	Focus Groups (Qualitative) + Surveys (Quantitative)	Mixed Methods	Menu Labeling Interventions, Facilitators to Healthy Eating	Focus Groups, Surveys

### 3.4. Quality Appraisal

The quality of the included studies was assessed by two independent reviewers, with a third reviewer resolving any disagreements. For the qualitative studies, the CASP (Critical Appraisal Skills Programme) qualitative research checklist was used, which evaluates aspects such as study design, sampling, data collection methods, and the coherence of findings (CASP, 2018). The CASP checklist is widely used in systematic reviews of qualitative studies, as demonstrated in systematic reviews such as those by Hannes et al. (2010) and Lund et al. (2016). For quantitative studies, the Axis tool was employed to assess study quality. The Axis tool evaluates factors like the appropriateness of the sampling strategy, representativeness of the sample, measurement methods, and non-response bias (Downes et al., 2016). This tool has been used in several systematic reviews assessing quantitative research, including reviews by Higgins et al. (2019) and Cochrane Collaboration (2020). For mixed-methods studies, the MMAT (Mixed Methods Appraisal Tool) was used, which evaluates both the qualitative and quantitative components of a study and integrates them into an overall assessment (Hong et al., 2018). The MMAT is widely used in systematic reviews that combine different types of study designs, such as those by Pluye et al. (2011) and O’Cathain et al. (2019).

**Table 4. Quality Appraisal of the Quantitative Studies using the Axis Tool**

Study	Sampling Strategy	Sample Representativeness	Measurement Appropriateness	Nonresponse Bias	Final Score (%)
AL Farwan, Wadha Mushabeb, 2011	No	No	Yes	Can't Tell	25%
Abdulrahman O. Musaiger et al., 2014	No	Yes	Yes	Can't Tell	25%
L. Daniuseviciute et al., 2018	Yes	Yes	Yes	Can't Tell	75%
L. Ashton et al., 2017	No	No	Yes	Yes	25%
Mazzola et al., 2013	Yes	Yes	Yes	Yes	75%
Mazzola et al., 2018	Yes	Yes	Yes	Yes	75%
Poobalan et al., 2014	Yes	Yes	Yes	Yes	75%
Chary A., et al., 2010	Yes	Yes	Yes	Can't Tell	75%
Blake et al., 2014	Yes	Yes	Yes	Yes	75%
Dobbins et al., 2017	Yes	Yes	Yes	Can't Tell	75%

1. Sampling Strategy: Evaluates whether the study used an appropriate sampling method, such as random sampling or convenience sampling. Studies with random sampling are scored higher.

2. Sample Representativeness: Assesses if the sample represents the target population, allowing for generalization. A sample that closely matches the diversity of the population is scored higher.

3. Measurement Appropriateness: Determines whether the study used valid, reliable, and appropriate measures to assess barriers and facilitators to healthy eating.

4. Nonresponse Bias: If the study discusses measures taken to reduce or account for nonresponse bias, it is marked as 'Yes.' If there's no mention of this, it remains 'Can't Tell.' If the study mentions clear actions taken (e.g., adjusted sampling or increased follow-ups), this indicates the study was proactive in managing bias.

**Table 5. Quality Appraisal of the Qualitative Studies using the CASP Tool**

Study	Is the qualitative approach appropriate?	Are the qualitative data collection methods adequate?	Are the findings adequately derived from the data?	Is the interpretation of results sufficiently substantiated by data?	Is there coherence between qualitative data sources, collection, analysis, and interpretation?	Overall Quality (High/Medium/Low)
Scott et al., 2020	Yes	Yes	Yes	Yes	Yes	High
Suplee et al., 2018	Yes	Yes	Yes	Yes	Yes	High
Salci MA, 2016	Yes	Yes	Yes	Yes	Yes	High
Cardenas MK, 2014	Yes	Yes	Yes	No	No	Medium
Chary A, 2010	Yes	Yes	Yes	Yes	Yes	High
Castro B., et al, 2011	Yes	Yes	Yes	Yes	Yes	High
Rodríguez-Morán M, 2015	Yes	Yes	Yes	Yes	Yes	High
Dobbins et al., 2017	Yes	Yes	Yes	Yes	Yes	High
Suplee et al., 2015	Yes	Yes	Yes	Yes	Yes	High
Mazzola et al., 2021	Yes	Yes	Yes	Yes	Yes	High
Roman et al., 2021	Yes	Yes	Yes	Yes	Yes	Medium
Melnik et al., 2017	Yes	Yes	Yes	Yes	Yes	Medium
Mendonça et al., 2019	Yes	Yes	Yes	Yes	Yes	High

Based on these criteria, studies were classified as having either high, medium, or low quality.

- High quality: The study meets all or most of the criteria with strong methodology, robust data collection methods, and a clear connection between the findings and data.
- Medium quality: The study meets some of the criteria but may have weaknesses in methodology, data collection, or analysis that impact the overall rigor.
- Low quality: The study has significant methodological issues or lacks sufficient evidence linking the findings to the data, resulting in concerns about its reliability and validity.

**Table 6. Quality Appraisal Tool for Mixed methods studies using MMAT**

Author(s), Year	Is there an adequate rationale for using a mixed methods design to address the research question?	Are the different components of the study effectively integrated to answer the research question?	Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	Total Score (High/ Medium/ Low)
Lim et al., 2019	Yes	Yes	Yes	Yes	Yes	High
Louey et al., 2021	Yes	Yes	Yes	Yes	Yes	High
Kerins et al., 2018	Yes	Yes	Yes	Yes	Yes	High

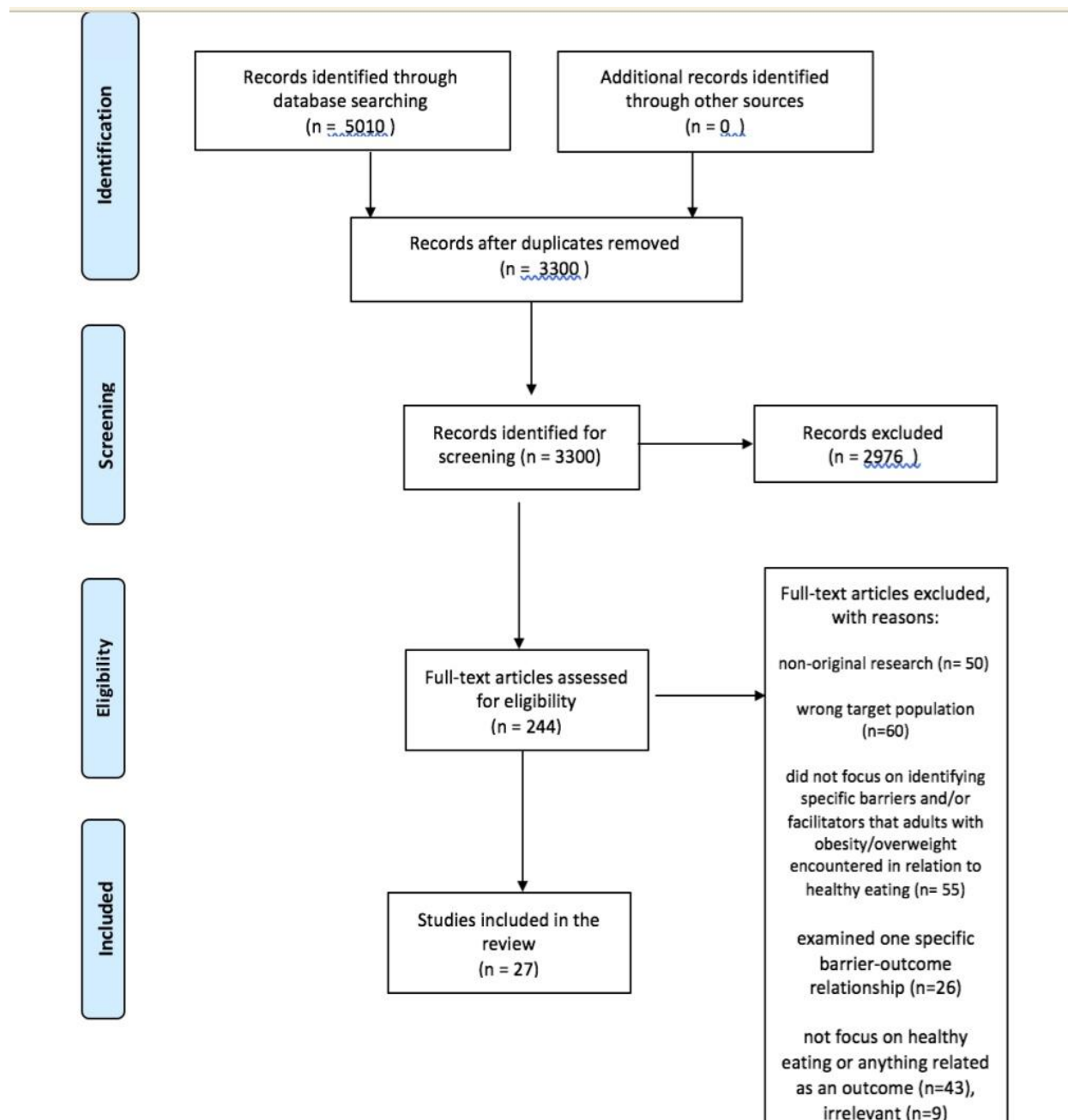
The total quality score for each study is categorized as 'High', 'Medium', or 'Low' based on its performance across the following MMAT criteria: 'Adequate Rationale for Mixed Methods', 'Integration of Data', 'Data Interpretation', 'Divergences Addressed', 'Adherence to Quality Criteria'. A 'High' score indicates strong alignment with the appraisal criteria, while a 'Medium' or 'Low' score indicates that there were concerns with how the study met these criteria.

### 3.5. Results

The current study follows the Preferred Reporting Items of Systematic Reviews and Meta-Analysis (PRISMA) guidelines for reporting the systematic reviews (Page et al., 2021). The search returned 5010 articles, of which 3300 were retained after removal of duplicates. Screening was initially conducted by three independent reviewers in which the titles and abstracts were screened for. As a preliminary step, a 5% sample of articles was



screened to ensure consistency between the reviewers. After the confirmation of consistency, the remaining articles were screened. The original findings yielded 89.4% agreement between the first and second reviewer and any conflicts were discussed and resolved with a third reviewer before moving on to the full text screening. The second step included full text reviews by one independent reviewer and any discrepancies were discussed and resolved with a second independent reviewer. Two thousand nine hundred and seventy-six studies were excluded based on screening titles and abstracts. Two hundred and forty four articles were reviewed in full text of which two hundred and seventeen were excluded. A total of twenty-seven papers were included after full screening and were retained as part of the systematic review (Figure 3).



**Figure 2. PRISMA Flowchart**

### 3.6. Sample size of included studies

In the research employing qualitative methods and mixed-method studies, 8 studies included sample of 1-30 participants, 8 studies included a sample of 30-70 participants. For the quantitative studies, all 10 of the articles included a sample ranged between 100

- 590 participants. The samples consisted of both male and female subjects in 17 out of the 27 studies, exclusively of female subjects in 6 studies and exclusively of male subjects in 4 studies. Most of the included research (11/27) were conducted in the United States (US) with five studies being conducted in the United Kingdom and three studies conducted in Australia. One study was conducted in Saudi Arabia, one in Kuwait and one in Lithuania, two in Belgium, one in Egypt and two in France.

### **3.7. Data Collection Methods and Instruments**

Out of the thirteen qualitative studies, ten studies conducted semi-structured interviews with focus groups to identify the facilitators and barriers (n=10). All 10 of the quantitative studies used questionnaires as the main instrument in identifying facilitators and barriers. Finally, 4 studies employed a mixed method approach. All 4 used questionnaires too alongside semi-structured interviews to identify the facilitators and barriers towards healthy eating (n=4).

### **3.8. Facilitators and Barriers**

The most important factors for all dimensions of the model, based on the frequency of participants' responses, are presented. For quantitative studies, only significant variables were evaluated. The synthesis identified eighteen unique factors operating as barriers across twenty-seven studies and 5 factors operating as facilitators over 8 studies. Through this systematic review, ten out of eighteen barriers were identified as intrapersonal barriers and 4 out of 5 were identified as facilitators.

**Table 7. Barriers and Facilitators**

Barriers	Facilitators
<b>Intrapersonal</b>	
Lack of willpower, motivation, and self-discipline to eat healthily (AL Farwan et al., 2011)	Being healthy and overall increase in energy (AL Farwan et al., 2011)
Inability to control cravings (Abdulrahman O. Musaiger et al., 2014)	Physical appearance (looking good) and increased self-esteem (L. Daniuseviciute et al., 2018)
Lack of time (L. Daniuseviciute et al., 2018)	Role modelling healthy behaviors to those around them (L. Daniuseviciute et al., 2018)
Lack of knowledge (L. Ashton et al., 2017)	Health motivation, family support, overall health improvement (Abdulrahman O. Musaiger et al., 2014)
Lack of skills to plan (L. Ashton et al., 2017)	Health-related benefits, knowledge improvement (Stankevitz et al., 2017)
Lack of enjoyment (classified healthy food as "boring") (Daniuseviciute et al., 2018)	Having the proper knowledge towards healthy eating patterns (P. Suplee et al., 2015)
Eating for other reasons than hunger (emotional eating) (P. Suplee et al., 2015)	Health knowledge, structured eating (L. Daniuseviciute et al., 2018)
Negative attitude towards healthy food (L. Ashton et al., 2017)	Self-motivation, family support (P. Suplee et al., 2015)
Preference for convenient unhealthy food (Stankevitz et al., 2017)	
<b>Interpersonal</b>	
Influence of eating behaviors of family and friends (social pressure) (Poobalan et al., 2014)	Social support from family and friends (García et al., 2017)
Lack of support and encouragement from family (García et al., 2017)	Social support, role models (Daniuseviciute et al., 2018)
Social commitments (e.g., family gatherings, cultural celebrations, dinner parties) (Rodríguez-Morán et al., 2015)	Social support from family (Rodríguez-Morán et al., 2015)
Cultural norms and preferences towards body images (P. Suplee et al., 2015)	None found
Gender-based stigmas towards healthy eating habits (Stankevitz et al., 2017)	
Fear of fussy children and other family members not liking the healthy cooked meals (Rodríguez-Morán et al., 2015)	

Barriers	Facilitators
Environmental	
Easy access and availability of unhealthy food and restaurants (AL Farwan et al., 2011)	Workplace wellness programs (Mazzola et al., 2013)
Cost of healthy food in comparison to unhealthy food (L. Ashton et al., 2017)	Workplace wellness programs, community programs (Mazzola et al., 2013)
Lack of access to healthy food (García et al., 2017)	Affordable healthy food (García et al., 2017)

### 3.9. Intrapersonal Factors

The lack of willpower to eat healthily and the inability to control cravings were mentioned as the biggest barriers. Lack of time was considered the second most important barrier. The third most important intrapersonal barrier was lack of knowledge (e.g. not knowing how to read calorie labels, not knowing the correct portion control, not knowing what specific foods are considered healthy). The most important set of facilitators that were considered intrapersonal were: Health benefits (e.g. eating healthier to avoid medical conditions, mental health effects, more energy). The second motivator identified was confidence and increased self-esteem and aesthetic purposes (physically looking better). Moreover, the third motivator was role modelling healthy behaviours to those around them (especially parental role towards their children).

### 3.10. Interpersonal factors

In the interpersonal domain, 4 out of the seventeen barriers and 2 out of the 6 facilitators were identified. The most important interpersonal barrier towards eating healthy was the eating behaviours of the people around them (family, friends, and co-workers eating habits) (e.g., being influenced to eating unhealthy at work due to co-workers ordering fast food). The second significant interpersonal barrier was having a lack of social support (e.g., un-supportive family, friends, and co-workers) and finally, the third identified barrier was social commitments (e.g., family gatherings, cultural celebrations, dinner parties). As for the interpersonal facilitators, social support was considered the most essential (from family, friends and co-workers), as well as having the proper knowledge towards healthy eating patterns.

### **3.11. Environmental factors**

Overall, 4 barriers were identified. No environmental facilitators were recognised. The most significant barrier that was found in several studies was the easy access and availability of unhealthy food (e.g., fast food restaurants located everywhere, fast food items found in many restaurants). The second most important barrier was the cost of healthy food in comparison to unhealthy food (e.g., fast food vs organic fruits and vegetables).

#### ***3.11.1. Facilitators and Barriers Identified Between Countries***

The studies from USA indicate that the availability of food labels, and knowledge of the nutritional element facilitate healthy eating habits. However, physical appearance, and performance facilitate healthy eating, in Australia and UK. The support from family, and the impression that healthy food choices will be appreciated and adopted by the family members especially children and partners were identified as major facilitators of healthy dietary habits.

The survey identified several individual factors, independent of the geographical location, that challenge an individual's healthy dietary habits, including lack of motivation, lack of knowledge, time constraint, the perceived gastronomic impression of healthy food (healthy food is not delicious), food craving and binge eating. The lack of support and encouragement from family and friends, as well as their attitudes towards healthy food, reciprocity, social pressure, and socialisation, were identified as common interpersonal factors. The cultural norms and preferences towards certain body images, eating habits, and gender-based stigmas were identified as geographically distinct interpersonal barriers. The macro-environmental factors such as the lack of access to healthy food, the high price of healthy food, and the easy availability of unhealthy junk food in restaurants were identified as common barriers to consuming a healthy diet.

### **3.12. Discussion**

#### ***3.12.1. Main findings***

The primary aim of this study was to comprehensively investigate the barriers and facilitators influencing healthy eating behaviors in adults with obesity. This review, to the best of our knowledge, represents the first systematic attempt to address these questions in this particular population. The identified factors were categorized into three overarching themes: Individual (intrapersonal), interpersonal, and environmental. The synthesis extracted eighteen unique factors operating as barriers across twenty-seven studies and identified five factors acting as facilitators in eight studies.

Intrapersonal barriers, including lack of motivation and self-control, time constraints, and insufficient knowledge, emerged as key obstacles hindering the adoption of healthy eating patterns among individuals with obesity or overweight (Abdelhafez et al., 2020, Ahmad et al., 2020, Ashton et al., 2015, Austin et al., 2022, Broers et al., 2021). Emotional factors such as stress eating, eating in the absence of hunger (Broers et al., 2021, Jung et al., 2021) and difficulty managing negative thoughts and moods were also prevalent (Abdelhafez et al., 2020, Ahmad et al., 2020, Ashton et al., 2017, Daniuseviciute-Brazaite & Abromaitiene, 2018). Emotions such as stress, anxiety, boredom, and loneliness were believed to lead to seeking comfort in food (Suplee et al., 2015, Withall et al., 2009). Since the ability to manage stressors and emotions can be particularly challenging for adults with obesity, using food as a reward, a coping mechanism, or a way to lift mood appears to be common (Withall et al., 2009). The studies revealed that stressful experiences were believed to trigger emotional over-consumption and reduce participants' ability to practice healthy eating behaviors (Ahmad et al., 2020, Ashton et al., 2015, Dao et al., 2019, Farwan, 2011, Lima et al., 2021).

Consistent with literature, a perceived lack of time is another key barrier to lifestyle modification, whether that is a lack of time or poor time management (Austin et al., 2022). The time required to shop and prepare food was identified as a major barrier for people who already struggled with busy family and work schedules. Finding balance among life's usual obligations, such as work and family routines, while still devoting time to health

appears difficult for adults with obesity (Shaheen et al., 2014). These factors were more prominent in the studies with female participants than those with males.

The lack of knowledge and awareness of both healthy and detrimental lifestyle behaviors was identified as a major barrier to adopting healthy eating habits among adults with obesity. These individuals often struggle with recognizing and calculating portion sizes, and there is a gap in understanding the negative effects of sedentary behavior (Stankevitz et al., 2017, Suplee et al., 2015, Withall et al., 2009). The basic understanding of a healthy diet and appropriate physical activities is frequently inadequate, highlighting the need for lifestyle intervention programs. This disconnect between the known facilitators and barriers to healthy eating in the scientific literature and those reported by individuals with obesity in the general population (Stankevitz et al., 2017, Suplee et al., 2015, Withall et al., 2009).

Research studies have also identified a lack of knowledge as a significant obstacle to making healthy dietary changes in adults with obesity (Ahmad et al., 2020, Ashton et al., 2017, Broers et al., 2021, Dao et al., 2019). Qualitative data showed that, despite the expectation that knowledge would have an impact on the relationship between belief variables and health behavior, a clear relationship was not found (Daniuseviciute-Brazaitė & Abromaitienė, 2018). This lack of influence of knowledge on behavior may be due to the type of knowledge measured in the study. The study suggests that while knowledge of health recommendations may influence healthy eating, a measure of procedural knowledge, or knowledge of how to put these recommendations into practice, may be more predictive of health behaviors (Pinho et al., 2018). Targeting diverse groups through tailored classes that address varying levels of nutrition knowledge, psychosocial characteristics, or health risks may result in more effective interventions (Farwan, 2011).

This review has also revealed that having an incentive is an integral facilitator in people with obesity to engage in healthy eating habits. Primary incentives include: improved health and the prevention of diseases, weight management, enhanced physical appearance, and increased self-confidence (Austin et al., 2022, Daniuseviciute-Brazaitė & Abromaitienė, 2018, Pinho et al., 2018, Román et al., 2021, Shaheen et al., 2014,



Suplee et al., 2015). By managing weight and appearance via diet, they felt that they are able to enhance their social image, popularity, and attractiveness and ultimately success in finding a partner (Baruth et al., 2014, Dao et al., 2019). Through similar mechanisms, interpersonal facilitators such as social and situational norms have the capacity to act as significant enablers. Role modeling healthy behaviors to those around them (especially parental role towards their children) was a substantial motivator to change their dietary habits (Dao et al., 2019, Garcia et al., 2017). Where norms foster healthy eating, such as friends and family eating healthily, it also encourages others to participate to feel included.

Although similar facilitators and barriers were identified between different countries and cultures, some substantial differences were also revealed. One of the major themes identified in the Middle Eastern countries (Egypt, Saudi and Kuwait) was related to hedonic decision-making (Melisse et al., 2020). Healthy foods, according to the participants, were believed to be unpleasant and flavorless to their family (Ahmad et al., 2020). Women from these Arabic countries felt they had to make separate meals for themselves if they adopted healthier eating habits. A similar observation was found in a sample of women from a Hispanic heritage in the US, who also reported a need to make separate foods for themselves (Román et al., 2021). Participants in France, on the other hand, cited stress and hectic lifestyles as the biggest barriers to healthy eating and did not.

### ***3.12.2. Limitations***

In large part, our systematic review was limited by the number of available studies and the shortcomings of the reviewed reports. Almost all of the included studies, with the exception of four mixed-method studies, were conducted using closed-ended questionnaires. As a result, the barriers, and facilitators addressed in the study were largely determined by investigator preference. Our results might have been altered if the studies would have employed a different taxonomy, even though the taxonomies included in the study are widely reported and aggregated in literature. Another limitation comes from the included studies being limited in terms of sampling and generalisability. Some studies employed small, non-random samples restricted to a few groups [for instance

Garcia et al. selectively sampled Hispanic men], which questions the generalisation, and the broader implications of the results (Garcia et al., 2017). Another limitation comes from the small number of indexed studies in electronic databases and the fact that the knowledge translation field spans many disciplines, relevant studies may have gone unnoticed, although referencing related studies found additional evidence.

### **3.12.3. Conclusion**

In conclusion, our systematic review provides a comprehensive overview of the facilitators and barriers influencing healthy eating behaviors among overweight and obese adults. The incorporation of the socio-ecological model by McLeroy enhances our understanding of the interconnected factors operating at different levels. This knowledge serves as a foundation for the next study (Chapter 4), which will be the qualitative study done in the UK and Jordan, that will be focused on delving deeper into the specific beliefs associated with these determinants of healthy eating, specifically, eating in moderation. By providing a nuanced understanding of the determinants shaping eating habits, our study aims to inform targeted public health intervention programs, fostering healthier dietary practices in diverse populations.

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## **CHAPTER 4. IDENTIFYING SALIENT BELIEFS TOWARDS EATING IN MODERATION OF ADULTS IN THE UK AND JORDAN - A QUALITATIVE STUDY**

### **4.1. Introduction**

Contemporary society is facing a significant public health challenge due to the increasing global prevalence of obesity (Agha & Agha, 2017; World Obesity Atlas 2022, 2022) particularly in Western countries like the United Kingdom and in the Middle East, including Jordan. Recent data reveals alarming statistics, with over 63% of adults in the UK classified as overweight or obese, while approximately 68% of adults face similar issues in Jordan (Bustami et al., 2021; World Obesity Atlas 2022, 2022).

The selection of Jordan and the UK as study locations was based on the grounds grounded in their alarming and escalating rates of obesity. The UK ranks third in obesity rates in Europe, signaling a critical public health concern (Tackling Obesity, 2023). Concurrently, Jordan holds the dubious distinction of having the third highest obesity rates in the Middle East (High Obesity Rates In The Middle East And North Africa, 2019).

Jordan provides insights into cultural norms and eating habits representative of the Middle East, contributing to a comprehensive understanding of unique challenges in this region. On the other hand, studying in the UK offers valuable insights applicable to diverse European contexts. This comparative study aims to generate findings that can guide future interventions not only within these specific nations but also serve as a model for addressing similar health crises globally.

Overweight and obesity arise from an imbalance between the intake and expenditure of energy (What Causes Obesity & Overweight?- NICHD, 2021). The consumption of high-energy foods along with increased portion sizes contributes significantly to this excessive energy intake (Ello-Martin et al., 2005; Rolls et al., 2007; B. A. Swinburn et al., 2004).

Additionally, several studies have indicated that a higher eating frequency may also play a significant role in this regard.

In view of the above, we highlight the importance of eating in moderation, which is under the broader umbrella of healthy eating. Eating in moderation is the opposite of excessive intake of energy-dense foods and large portions (Haines et al., 1999). This includes choosing smaller portion sizes, moderating eating frequency, and opting for low-energy-dense foods. Rolls et al. reported that eating in moderation allows for a more flexible and sustainable eating pattern, rather than a strict diet (Rolls, 2009). Research indicates that adopting a moderate eating pattern is linked to sustained reductions in energy intake without an accompanying increase in feelings of hunger (Kral et al., 2004; Rolls et al., 2007). Therefore, promoting this approach could be a promising strategy for interventions focused on reducing obesity rates, offering a viable alternative to more restrictive dietary measures.

Moreover, promoting education and awareness about nutrition, portion control, and the importance of balanced meals can significantly contribute to lowering obesity rates. Encouraging communities to prioritize healthy eating and making nutritious food more accessible can also play a crucial role in combating this global public health challenge.

To effectively promote moderation in eating through interventions, it is essential to possess a comprehensive understanding of the key determinants influencing this behavior (Kay Bartholomew Eldredge, 2016).

This study aims to investigate the beliefs influencing individuals' adoption of healthy eating habits using the I-Change Model framework. By examining six key socio-cognitive determinants, we aim to uncover specific beliefs related to healthy eating and moderation in order to better understand these populations' perspectives. The study seeks to offer new insights into health behaviors among adults in both the UK and Jordan with an emphasis on informing targeted interventions for promoting healthier lifestyles.

The Integrated Change Model (I-Change Model), incorporates various social cognitive theories, including the Theory of Planned Behaviour, the Health Belief Model, and Socio-

Cognitive Theory. It has proven successful in predicting health-related behaviors, including sexual health behaviors (de Vries et al., 2014; Huver et al., 2006). The I-Change Model comprises three phases: pre-motivational, motivational, and post-motivational (De Vries, 2017)

The pre-motivational phase, also known as the awareness phase, involves individuals becoming conscious of a problem and their associated risks. Awareness hinges on factors such as knowledge, risk perceptions, cues to action, and awareness of one's behavior. If individuals develop awareness of a health issue and associated risk behaviors, they progress to the motivational phase. In this phase, individuals contemplate adopting health-promoting behaviors or reducing risk behaviors. Motivation or intention is determined by attitudes, social influence, and self-efficacy (De Vries, 2017; Vries et al., 2005).

Attitudes encompass the perceived cognitive and emotional advantages and disadvantages of the behavior (Vries et al., 2005). Social influence perceptions are shaped by the observation of others engaging in a specific behavior (social modeling), social norms, and social support for adopting the behavior (De Vries et al., 1998). Self-efficacy refers to an individual's belief in their capability to execute a particular behavior across various situations (de Vries et al., 1988). Together, these motivational factors predict the intention to adopt specific healthy behaviors.

The translation of intention into behavior constitutes the post-motivational phase. This phase is influenced by a person's level of intention, self-efficacy, action planning, plan enactment, and the encountered level of barriers (De Vries, 2017).

## **4.2. Methods**

### ***4.2.1. Design***

This study employed a qualitative research design, utilizing interviews as the primary data collection method. The interviews were guided by a pre-established topic guide, incorporating general demographic questions such as age, BMI, gender, level of

education, marital status, and number of children. Semi-structured interviews were conducted to have in-depth understanding of the topic.

Interviews were conducted based on a predetermined topic guide, encompassing general demographic inquiries about age, gender, education, employment, residence, and vaccination status. Following the demographic segment, questions aligned with the I-Change Model were presented, developed by integrating the model with the guidelines outlined by Atkins et al. (2017) for applying the Theoretical Domains Framework (TDF) of behaviour change (Atkins et al., 2017). Widely employed in research on health behaviour determinants and the adoption of health interventions, the I-Change Model consolidates principles from the Social Cognitive Theory, Health Belief Model, Theory of Planned Behaviour, Trans-Theoretical Model, and Goal Setting theory. The model posits that behavior change unfolds through three phases: awareness, motivation, and action, each with its corresponding determinants (Cheung et al., 2020). The methodology applied in this study, as detailed by Atkins et al. for achieving implementation objectives through TDF, is grounded in the I-Change Model as the theoretical foundation (Atkins et al., 2017).

#### ***4.2.2. Sampling and participants***

Participants for this study were recruited through two distinct yet similarly structured processes. For the UK sample, recruitment was conducted via Prolific, an established online research platform that connects researchers with potential participants. Upon accessing the platform, potential participants were presented with a detailed study description, outlining the objectives, eligibility criteria, and commitments required for participation. Interested individuals could express their willingness to participate through the platform, after which they received further information via email.

In Jordan, recruitment was facilitated through two nutrition clinics, where invitation leaflets were placed in reception areas. These leaflets provided clear information about the study, including the purpose, inclusion criteria (adults aged 18 years and above, residing in Jordan, with a BMI of 25 kg/m<sup>2</sup> or above), and exclusion criteria (pregnant women and individuals with chronic medical conditions such as diabetes, hypertension, or cardiac issues). The leaflets invited interested individuals to contact the researcher directly via

the provided email address. Upon expressing interest, participants received a participant information sheet, an online consent form, and a demographic questionnaire via email to ensure they were fully informed about the study's procedures and ethical considerations before consenting to participate. This thorough approach aimed to foster trust and transparency between the researchers and participants, ultimately enhancing the integrity of the study.

Only those who satisfied the inclusion criteria were contacted to schedule an interview. The interviews (Appendices I and J) were conducted via Microsoft Teams to facilitate remote participation. Participants from the UK received monetary compensation through Prolific, while Jordanian participants were provided with a 5 JOD gift voucher.

#### **4.2.3. Data Collection**

Data collection was standardized across both UK and Jordanian participants, ensuring consistency in the information gathered. Interviews were conducted online using Microsoft Teams, allowing participants to join from their preferred locations. Each interview lasted between 45 minutes to one hour, depending on the depth of participants' responses. A pre-established topic guide, based on the I-Change Model (Figure 2), directed the discussions. The guide covered key themes such as awareness of healthy eating behaviors, motivation to adopt these behaviors, and self-efficacy in maintaining them (Appendices I and J). Sample questions included inquiries about participants' understanding of healthy eating, their perceived benefits and barriers, and their confidence in adopting and sustaining dietary changes. Prior to the interviews, participants were provided with the participant information sheet (Appendices C and D) and consent form (Appendices E and F), which they reviewed and returned via email. The documents outlined the study's purpose, procedures, and ethical considerations, ensuring participants were fully informed.

To ensure accurate BMI data collection while addressing the sensitivity of the topic, participants were instructed to self-report their weight and height in a confidential manner. The questionnaire included clear guidelines to assist participants in providing their measurements accurately. Additionally, the researcher emphasized the importance of

privacy and comfort, assuring participants that their responses would remain anonymous. Recognising the stigma often associated with obesity, the study employed neutral and supportive language throughout the data collection process. Participants were also informed that discussing their weight and eating habits was entirely voluntary, and they could skip questions they felt uncomfortable answering. This approach aimed to create a safe environment for participants to share their experiences and beliefs without fear of judgment.

#### ***4.2.4. Data Analysis***

The analytical strategy employed in this study involved a systematic deductive content analysis approach, guided by the I-Change Model. This framework facilitated the identification of socio-cognitive beliefs regarding healthy eating and moderation. The coding process was structured, with the development of a coding guide based on the constructs of the I-Change Model. Each interview was independently coded using NVivo software, ensuring a consistent application of the coding framework. To maintain reliability, regular discussions among coders were held to resolve discrepancies, and Kappa coefficients were calculated yielding values of 0.84 and 0.91 for the Jordanian and UK samples, respectively, indicating strong agreement between coders. This iterative process underscored the rigor of the analysis and ensured that the findings accurately represented the participants' beliefs. A total of 1480 utterances from 37 interviews were coded into nine main constructs, each containing several sub-constructs. Representative statements were generated to capture the participants' beliefs, offering detailed insights into their perceptions. Recurring themes were grouped under broader categories, such as "Moderation Strategies," which encompassed related concepts like portion control, conscious eating, and food choices. The generated statements underwent review by the research team to ensure accuracy and relevance to the research questions. Belief frequencies were recorded for both groups, with each belief counted once per interview. This rigorous approach ensured a comprehensive and reliable analysis of the data.



#### **4.2.5. Ethical Considerations**

Prior to participation, all participants received comprehensive information about the study's aims and procedures through a participant information sheet (PIS) and a consent form. The PIS thoroughly described the study's objectives, data collection procedures, confidentiality measures, potential risks and benefits, and contact information for the research team and ethical oversight bodies. Informed consent was obtained from each participant before the interview commenced. To protect participant privacy and ensure confidentiality, no personal identifying information, such as names or contact details, was collected during the interviews. BMI data collected in the demographic questionnaire was self-reported in order to maintain privacy and reduce potential discomfort regarding sensitive information. All data was anonymised and coded immediately after collection, and the linking coding documentation was stored separately to maintain participants' right to withdraw their participation. Data was securely stored on Brunel University's servers and will be retained for up to ten years, after which it will be safely destroyed. Participants were informed of their right to withdraw from the study at any time before the publication of the thesis. The study was reviewed and approved by the College of Health, Medicine and Life Sciences Research Ethics Committee at Brunel University London [Appendix K].

### **4.3. Results**

#### **4.3.1. Participants**

The final sample ( $n = 37$ , referred to as the total) consisted of 20 participants from Jordan and 17 participants from the UK, who met the study's inclusion criteria (age 18 years old and above, residents of the UK or Jordan, willingness to participate, a BMI of 25 kg/m<sup>2</sup> or above). Participants with chronic illnesses such as diabetes, hypertension, or cardiac issues as well as those who were pregnant, were excluded to maintain a focus on the individuals without pre-existing health conditions affecting dietary behaviours.

Participants from Jordan included an equal number of males and females, with ages ranging from 20 to 58 years; with a mean age of 34 years and a mean BMI of 30.54 kg/m<sup>2</sup>. In the UK sample, participants' ages ranged from 25 years to 45 years with a mean

age of 34 years and a mean BMI of 31.02 kg/m<sup>2</sup>. The demographic breakdown for both groups is presented in Table 8.

**Table 8. Summary of Demographic Characteristics (Jordan) and Summary of Demographic Characteristics (UK)**

Demographic Characteristic	Jordan (n=20)	UK (n=17)
Age (Mean)	34	34.76
Age (Median)	32	33
Gender (Male)	10 (50%)	8 (47.1%)
Gender (Female)	10 (50%)	9 (52.9%)
Highest Education - High School Diploma	4 (20%)	2 (11.8%)
Highest Education - College Degree	11 (55%)	12 (70.6%)
Highest Education - Graduate Degree	5 (25%)	3 (17.6%)
Income Level - Less than \$25,000	6 (30%)	1 (5.9%)
Income Level - \$25,000 - \$50,000	7 (35%)	12 (70.6%)
Income Level - \$50,000 - \$100,000	5 (25%)	3 (17.6%)
Income Level - \$100,000 - \$200,000	2 (10%)	1 (5.9%)
Marital Status - Single	9 (45%)	7 (41.2%)
Marital Status - Married	9 (45%)	10 (58.8%)
Marital Status - Divorced	2 (10%)	0 (0%)
Children - None	11 (55%)	8 (47.1%)
Children - 1	1 (5%)	2 (11.8%)
Children - 2-4	5 (25%)	7 (41.2%)
Children - More than 4	2 (10%)	0 (0%)
BMI (Mean)	30.54	31.02

### **4.3.2. Awareness phase beliefs**

Table 2 presents the identified socio-cognitive beliefs of the participants from the UK and Jordan, regarding the awareness phase which included the constructs of knowledge and risk perception. To explore the knowledge of the participants considering healthy eating, they were asked what a healthy diet consisted of. Participants reported had a generally similar understanding of what healthy eating includes. All participants from both the UK (n=17, 100%) and Jordan (n=20, 100%) believed that healthy eating includes eating lots of fruits and vegetables. Similarly, (n=16, 80%) of Jordanians as well as (n=12, 70.5%) of the UK participants mentioned that eating protein like fish and chicken is an example of healthy eating. Moreover, (n=13, 65%) and (n=12, 70%) of the participants from Jordan and the UK, respectively, believed that avoiding junk food and fast food chains are considered healthy eating. Furthermore, approximately 40% (n=9, n=7) of participants from both Jordan and the UK shared similar beliefs regarding healthy eating, predominately defined by avoiding sugar-like sweets and high-sugar beverages as well as switching white bread to brown bread.

Several differences were also observed. 55% of Jordanians (n=11) believed that a healthy diet consisted of eating dairy products; whereas, none of the participants from the UK reported that. Moreover, 30% of the participants from Jordan (n=6) reported that cooking with olive oil instead of corn oil was considered healthier; while 0% of the participants from the UK mentioned that. Additionally, 23.5% of the UK sample (n=4) had a belief that reducing or avoiding red meat was an example of eating healthier. In contrast, 40% of Jordanians (n=8) believed that more protein, including red meat and fewer the number of carbohydrates like bread and rice, was healthier.

To explore the knowledge of participants concerning eating in moderation, most participants from both populations (n= 24) focused on smaller portion sizes to describe eating in moderation. In addition, approximately half of the total participants (n=18) from both Jordan and the UK, believed that having a cheat day or a cheat meal and then reducing the amounts of calories the next day, was considered a way of balanced eating or eating in moderation. Moreover, around 35% (n=7) and 29% (n= 5) of the UK and

Jordanians, had beliefs that reducing junk food, 'take out' food and having a diet that consisted of a balanced number of macronutrients was considered eating in moderation.

Half of the Jordanian participants reported that eating in moderation included having a scheduled eating pattern especially without skipping breakfast (i.e three scheduled meals, breakfast, lunch and dinner). Only three participants in the UK reported similar structured eating patterns equated with moderate eating. Another notable difference between the participant groups was avoiding late dinners, which was a belief that many Jordanian participants had (n=8, 40%); whereas only two participants (n=2, 11.7%) from the UK sample did. Finally, more than half of the Jordanian participants (n= 11, 55%) reported that eating fewer carbohydrates defined a moderate diet, in comparison to only 23.5% (n=4) of the UK participants who held a similar belief.

All of the participants reported that they (n=37, 100%) were concerned about their physical health, having experienced long-term consequences such as cardiovascular diseases, Diabetes Miletus and joint problems. Similarly, several of the participants from Jordan and the UK (n=8, and n=10,) believed that one of the risks of not eating healthy and in moderation would be weight gain leading to obesity. Another notable belief both populations had (n=12, n=11) was the risk of having low energy levels during the day. Furthermore, more than half of the Jordanian participants (n=13,) believed that not eating healthy and in moderation would lead to weight gain, which in turn would affect their physical appearance. A few of the participants from the UK reported that physical appearance would be a negative consequence of not eating healthy and in moderation. UK participants (n=8) indicated not eating healthily led to difficulties with mood, such as irritability and low mood throughout the day; whereas none of the participants in Jordan reported this belief.

**Table 9. Awareness phase beliefs**

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN n=20)	Frequency UK (n=17)
KNOWLEDGE %				
<b>Knowledge of what a healthy diet consists of</b>	Healthy eating includes fruits and vegetables	<p>“eating lots of fruits and vegetables, having salads”</p> <p>“eating cucumbers and carrots and lots of vegetables”</p> <p>“eating lots of veggies, I remember my mom always telling us to eat things like beetroot and spinach... and having lots of salads.”</p> <p>“someone who eats lots of greens and fruits, maybe like apples and grapefruits.”</p> <p>“first thing that comes to mind is salads. You know, just vegetables, fruit.”</p>	20 (100)	17 (100)
	Healthy eating includes eating protein (like fish, chicken, etc.)	<p>“eating like fish, vegetables, grilled chicken, so protein as well as vegetables and fruit, obviously.”</p> <p>“Just sticking to lots of protein like chicken breast and grilled steak and things like that”</p>	16 (80)	12 (70.5)
	Healthy eating includes eating dairy products (milk, yoghurt, white cheese)	<p>“also have breakfasts like labaneh and zaatar and olive oil”</p> <p>“having brown toast with a slice of white cheese and cucumbers on the side for breakfast”</p> <p>“having a light snack like a cup of shaneenah”</p>	11 (55)	0 (0)
	Healthy eating means avoiding sugar (sweets, chocolate, sugary beverages, etc.)	<p>“avoiding sweets..”</p> <p>“it’s what the media tells us it should be so no sweets, no chocolate, products are fresh”</p> <p>“And then like avoiding sugary snacks, like chocolates and candy”</p>	9 (45)	7 (41)
	Healthy eating includes eating a low fat diet (low fat cheese, low fat milk, etc.)	<p>“also having light low fat cheese and whole grain cereal instead of high fat food”</p> <p>“Healthy to me means food that’s good for you, not fattening like drinking skim milk instead of whole fat”</p> <p>“having a low fat % steak instead of the full fat ones”</p>	4 (20)	10 (58.8)

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN n=20)	Frequency UK (n=17)
KNOWLEDGE %				
	Healthy eating means avoiding junk food and fast food chains	“staying away from cheap fast food places” “avoiding places like McDonalds and KFC..” “not eating junk food like burgers and pizza, french-fries.”	13 (65)	12 (70)
	Healthy eating means eating more home cooked meals	“eating more home cooked foods instead of ordering from out”	8 (40)	3 (17.6)
	Healthy eating means reducing the amount of Red Meat	“..cutting down on red meat. Eating lots of grilled chicken, fish..” “And some types of meat, but in moderation, less of red meat”	0 (0)	4 (23.5)
	Healthy eating includes protein shakes and protein bars	“maybe also like energy and protein bars and shakes and stuff like that”	0 (0)	6 (35.2)
	Healthy eating includes cooking with olive oil instead of corn oil	“...more grilled than fried and using olive oil for example”	6 (30)	0 (0)
<b>Knowledge of what eating in moderation is</b>	Eating 3 separate and scheduled meals , no skipping meals	“eating 3 balanced meals, no skipping meals and having a fixed time for your meals” “making sure to eat breakfast, lunch and dinner not randomly eating all day”	10 (50)	3 (17.6)
	Smaller portions	“moderation isn't removing anything from your diet, so you're still eating everything but just concentrating on portions” “reducing the amounts of the food you're eating I guess. So like instead of 2 plates of roast cutting it down to one or instead of drinking beer all day try to cut down” “someone who tries to eat balanced, smaller portions and more frequent meals	13 (65)	11 (64.7)
	Having only one high calorie snack a day	“So instead of having chocolate, chips and icecream for snacks have only one of those options”	2 (10)	3 (17.6)
	Eating everything within calorie limit	“eating everything within calorie limit and less portions”	4 (20)	2 (11.7)

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN n=20	Frequency UK (n=17)
KNOWLEDGE %				
	Having a cheat day/meal but then make up for it the next day/meal	<p>"like if you have a heavy lunch, then try to balance it with a light dinner for example or if you go all out one day then you balance it out the next day but having light food"</p> <p>"So kind of like having a healthy balanced diet during the week and then like one cheat day or cheat weekend or something like that"</p>	9 (45)	9 (52)
	Eating more protein and fewer carbs (rice,bread..)	<p>"having a few spoons of rice instead of a whole plate"</p> <p>"cutting out bread and rice and having them in very few amounts"</p> <p>"whatever your meal is..just eat the meat and try to cut out the rice or bread but if you must have a few table spoons"</p>	8 (40)	4 (23.5)
	Stop eating before getting too full	"eating just half way before you're really full..you know that feeling where you're just going to pop after eating? Yeah so staying away from that."	2 (10)	2 (11.7)
	Including balanced macronutrients (protein, fat, carbs..)	"eating balanced meals with all the nutrients like protein and carbs and fat"	5 (25)	6 (35.5)
	Avoiding late night dinners	"definitely not eating like a few hours before bedtime. Maybe a light snack if you must."	8 (40)	2 (11.7)
	Reducing junk food and take out	"trying to stay away from junk food as much as possible and replacing them with healthy meals like grilled instead of fried"	7 (35)	5 (29.4)
Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN (n=20)	Frequency UK (n=17)
RISK PERCEPTION				
<b>Risks of not eating healthy and not in moderation</b>	Risk of gaining weight and obesity	<p>"Gaining lots of weight to a point where you've reached morbid obesity"</p> <p>"Gaining weight and becoming obese"</p> <p>"That is a huge risk to me, especially because my dad was obese all his life and ive seen him suffer because of that."</p>	8 (40)	10 (58.8)

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN (n=20)	Frequency UK (n=17)
RISK PERCEPTION				
	Risk of physical health issues: cardiovascular, diabetes, joint issues, etc..	<p>"I gained a lot of weight over the years and it's been giving me major problems in my joints I can barely pray while standing"</p> <p>"then you will be prone to more diseases and a high cholesterol"</p> <p>"I know that increases the cholesterol levels and that obviously will cause like heart problems"</p>	20 (100)	17 (100)
	Risk of mental health issues: mood, irritability, stress etc.	<p>"Also when your diet is just kind of all over the place you would always be gaining weight and that would put a toll on your mental health..like just feeling down all the time and not feeling your best"</p> <p>"Also Mentally drained probably. I like constant negative vibes. Depression sometimes can be."</p> <p>"but also mentally, your mood, always feeling irritable,"</p>	0 (0)	4 (23.5)
	Concerned about physical appearance and self esteem	<p>"will just make my self esteem so low because I wouldn't feel comfortable in my old clothes and id have to buy new bigger sizes which makes me stressed"</p> <p>"And also it would affect the way you look, self-esteem as well because I wouldn't be comfortable and find clothes easily."</p> <p>"But in terms of body, definitely, you know you gain weight and you just won't look fit or feel fit as well and you know everyone would judge you based on the way you look like first impression you know"</p>	13 (65)	6 (35.5)
	Concerned about energy levels throughout the day (low energy, can't exercise, go up the stairs, etc..)	<p>"And having that happen will not only affect your physical health. having low energy levels as well"</p> <p>"always feeling tired, no energy just feeling lazy and not feeling good about myself."</p> <p>"not be able to exercise and go to the gym just always being low on energy"</p> <p>"like just feeling drained all the time and not motivated to be active"</p>	12 (60)	11 (64.7)



#### **4.3.3. Motivation phase beliefs**

In terms of the advantages of eating healthy and in moderation, both groups reported similar examples of advantages. The most reported belief that both populations shared was that eating healthy and in moderation would lead to overall improved physical health and reduce the likelihood of diseases. Furthermore, (n=12, 60% and n=12, 70%) of the Jordanian and UK participants, respectively, believed that their self-esteem will be enhanced when adopting healthier eating habits. It was also stated by both populations (n= 25, 67.5% of total) that eating healthy and in moderation would make them feel more in control of their diet..

The main differences that were observed between the Jordanian and UK samples for motivational beliefs were that 70% of Jordanian participants (n=14) believed that eating healthier and in moderation would lead to an enhanced physical appearance and be the reason for an increase in one's self-esteem and confidence. However the former was only reported by 41.1% (n=7) of the UK population. Moreover, 45% (n=9) of the UK sample mentioned that eating healthier and in moderation would eliminate the need to be on a strict diet and therefore decrease their stress in that aspect. None of the participants from Jordan believed that. Finally, 30% of the UK participants (n=5) reported that eating in moderation would make them feel more in control and discipline as well as setting a good example for their children and family.

In regards to the disadvantages, the majority of the participants from Jordan n= 17 stated that eating healthy and in moderation would make it difficult for them to attend social gatherings such as going out to eat at restaurants with their social circle. In addition, around half of the participants from the UK and Jordan (n=20, 54% of the total) reported that healthy ingredients were costlier and lacked flavour/variety.

One of the primary dissimilarities between the two groups was more than half of the participants from the UK (n=13, 65%) stated that the lack of time was a disadvantage. It was reported that eating healthily required time to prepare and cook meals compared to less healthy options. Only 35% (n=7) of Jordanians stated that eating healthily resulted in using more time. Moreover, (n= 12, 70.5%) of the Jordanian participants mentioned

that eating healthy was the difficulty they would face when ordering at a restaurant or from food delivery apps.

The construct of self-efficacy referred to the perceived challenges faced when deciding to eat healthier and in moderation. Most of the participants from Jordan and the UK (n=12, 60% and n=10, 58.8%) shared a similar belief which was the difficulty to change certain habits and decreasing portion size posed a challenge in adopting healthy eating habits. Furthermore, both groups (n=7, 35% and n=6, 35.5%) reported that because they believe they do not have sufficient knowledge of how to start eating healthy and in moderation, stress and overwhelm will make it challenging to stick to changing their behaviours.

One of the notable differences between the participants from Jordan and the UK was that Jordanians (n=5, 25%) reported challenges related to cultural and social pressures. They reported that attending family gatherings, especially parties, weddings and Islamic events such as Ramadan and Eid, would make it challenging for them to eat healthily and in moderation. On the contrary, none of the UK participants reported such a belief.

The final construct in the motivation phase was a *social influence*, consisting of three sub-constructs; social norms, modelling, and support. Four participants (35.2%) from the UK and three participants from Jordan (20%) stated that the people in their social circle practice eating healthy and in moderation. Finally, the majority of the participants in Jordan and the UK believe that everyone around them believe that healthy eating and eating in moderation is important.

Finally, participants were asked who would support them if they decide to change their eating habits and start eating healthier and in moderation. Nine participants (45%) from Jordan and eleven participants (64.7%) from the UK believed that their friends and/or family would be supportive of their decision and motivate them. However, fourteen participants (70%) from Jordan had a belief that although people around them would not be against their decision, they would be facing pressure from their social circle when going out to eat or attending family gatherings. Only five participants (29.4%) from the UK sample reported a similar belief. The motivation phase beliefs can be found in table 3.

**Table 10. Motivation phase beliefs**

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN (n=20)	Frequency UK (n=17)
ATTITUDE				
<b>Perceived advantages</b>	Much healthier and therefore decreases chances of getting any diseases	"therefore reduce your chances of getting diagnosed with diseases some might be severe and some not but overall it affecting your health for sure"	<b>20 (100)</b>	<b>17 (100)</b>
	Better physical appearance	"So I guess when you look good you start feeling good and that's just going to make me feel more confident"  "when you feel heavy and bloated you just don't feel good about yourself. So if I'm feeling and looking light I think that would just improve my confidence big time."	14 (70)	7 (41.1)
	Enhance self esteem	"of course just the overall feeling of being more satisfied with the way I am you know"  "of course. cause like it's effects your overall life..like a positive impact like on your life in general."	12 (60)	12 (70)
	Eliminates the need to go "on a strict diet"	"if you're not paying attention to what you're eating and how much of it, and maybe you always need to be dieting and that's the absolute worst"	0 (0)	9 (52.9)
	Feeling in control	"you feel like you're more in control.. like just makes you feel good and disciplined"	3 (15)	5 (29.4)
	Make healthier food choices	"I think you'll become more conscious of what you put in your mouth..especially when it comes to mindlessly snacking on chocolate"	4 (20)	6 (35.3)

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN (n=20)	Frequency UK (n=17)
ATTITUDE				
<b>Disadvantages</b>	Avoiding social gatherings (weddings, eating out at restaurants, friends gathering	<p>"I think it would make it really difficult for me to attend parties and events"</p> <p>"Like social gatherings, I feel like it would be embarrassing to turn down your older aunt for example who keeps telling you to eat more and keeps adding food to your plate"</p> <p>"everything close to our university are fast food places you know like we have a huge McDonalds right next to us and almost every day we go there for lunch with my friends"</p>	17 (85)	0 (0)
	No time to cook at home	<p>"I feel like with my job it would be so hard to make time for cooking at home"</p> <p>"it's just so much easier to grab a quick bite on my way home from work"</p> <p>"I think I guess I would have to start cooking more at home because I can't really think of any places I can order from that are actually healthy and delicious at the same time. So I'd have to make my own thing and that's just super time consuming"</p> <p>"I don't have the time to cook and prepare meals that I would like... healthy meals... I do a lot of that frying because it's just quicker and easier and faster you know?"</p>	7 (35)	13 (76.5)
	Healthy ingredients are more expensive	"Buying all those organic and healthy products are actually more expensive than just getting the unhealthy cheaper kind"	10 (50)	10 (58.8)
	Healthy ingredients are harder to find at supermarkets	<p>"There's not really any long term studies, like scientists are just watching as we go along and to see if there's any long term risk, so I believe that's the only disadvantage"</p> <p>And the supermarkets next to my house just have the basic things they don't have those healthier fancier options you see everywhere else"</p>	11 (55)	5 (29.4)

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN (n=20)	Frequency UK (n=17)
ATTITUDE				
	Cannot eat whatever one pleases	<p>I think I would worry most about which supermarket I would have to go to to find all those things, the one next to our house doesn't really have much variety"</p> <p>"Imagine craving a piece of chocolate caked with some ice-cream on the side so I can eat while watching my favourite tv show. But then I feel like I can't do that if I'm trying to eat more healthy</p>	10 (50)	7 (41)
	Much more difficult to order at a restaurant/ food delivery apps	"I think restaurants have so much unhealthy food on their menu, much more than the healthy kind that's for sure"	12 (70.5)	8 (47.05)
SELF-EFFICACY				
	Find it challenging to eat smaller portions	<p>"Personally, I think it would be hard to change my habits, I love eating a huge dinner at night so I think I would have to change that"</p> <p>"It's become almost a habit of mine to eat late dinners and huge portions and the table actually needs to have a lot of different dishes on it. That's something I'm used to eating so changing that would be really hard for me I think especially at first"</p>	12 (60)	10 (58.8)
	Find it challenging to eat healthy and in moderation with the current knowledge I have	"I feel like I wouldn't know where to start, I might become overwhelmed when I start searching for guidance but not know anything"	13 (65)	6 (35.2)
	Challenging to eat healthy and in moderation during social gatherings	<p>"Especially during Ramadan for example we usually have huge portions of food and they're not really considered healthy to be honest"</p> <p>"resist social gatherings and going out to eat at restaurants and celebrations like I mentioned like Ramadan and Eid"</p>	12 (60)	0 (0)

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN (n=20)	Frequency UK (n=17)
SOCIAL INFLUENCE				
<b>Social norms</b>	Eating healthy and in moderation is important	"They all know how important it is because they've seen both my father and uncle get heart problems because of obesity"	14 (70)	13 (76.4)
<b>Support</b>	People adding pressure and non-supportive of the decision to start eating healthy and in moderation	<p>"my friends and I love to go out to restaurants or order take away to our house when we're all gathered so I feel like they would want me to get burgers and pizza and things like that"</p> <p>"I'm sure my husband and children are going to find a hard time adjusting because if I'm going to be making any changes to my lifestyle they will need to follow it as well otherwise I'm going to end up stressing them out!"</p>	14 (70)	5 (29.4)
	Support from close social circle	<p>"Uh, so I live with my sister and we like. For example, if I want to eat healthier she wants to eat healthy. We do it together so I find that that's very good. So it's not like one of us is eating healthy and the other one is like snacking on like McDonald's"</p> <p>"I think it's more of a positive thing where if you're eating healthy people do root for you. They want you to sort of keep it going."</p>	9 (45)	11 (64.7)

#### 4.3.4. Action phase beliefs

All of the participants from the UK and Jordan reported that they had the intention to start eating healthier and in moderation shortly.

Regarding the construct of preparatory planning, participants who intended to start eating healthier and in moderation were asked how they would start to plan for such a lifestyle change. More than half of the total participants (n=23, 62%) stated that making slow and gradual changes to their diet rather than cutting out items drastically would be an

important step to start. Moreover, around 25% of the total participants mentioned that clearing out their kitchen cabinets and removing any temptations around them would be one of the ways to start preparing for their eating lifestyle changes.

One of the differences mentioned between the participants from Jordan and the UK was that twelve (60%) Jordanians believed that it was crucial to have a specific meal plan. Participants reported that the plan can be devised alone or in consultation with a professional. Only six participants (35.2%) from the UK thought a meal plan was crucial to healthier eating. In addition, more than half of the UK participants reported that searching for easy and healthy recipes on the internet such as Youtube videos would equate to good preparation. None of the Jordanians reported recipe searching was important.

Difficulties and challenges to eating healthier and in moderation were discussed as part of the construct of self-efficacy. Participants were asked how they would cope with the named difficulties. The majority of the participants from Jordan and the UK (n=11, 55% and n=7, 41%) believed that asking for support from their social circle is an important way of coping with any difficulties. Almost 40% of the total participants believed that writing a list of goals and a reminder as to why they want to make these changes to their eating habits was a way to cope. Furthermore, 30% of the participants from the UK (n=5) mentioned that joining support groups and online forums where like-minded people could be found, would also aid in coping. None of the Jordanian participants reported attempting to cope in this manner. Finally, around 30% (n=5) of the UK participants stated that joining a gym membership would help them cope as they would start seeing results to keep pushing them forward. Only 10% (n=2) of the participants from Jordan shared that same belief. The action phase beliefs are presented in table 4.

**Table 11. Action phase beliefs**

Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN (n=20)	Frequency UK (n= 17)
<b>Intention</b>	Intending to start eating healthier and in moderation in the near future	<p>"Yeah, yeah, I've actually started last week, so I've been good for the past two weeks. So yeah, I do intend to continue."</p> <p>"If I come up with the right plan and I won't have to sacrifice much, yes definitely"</p>	<b>20 (100)</b>	<b>17 (100)</b>
<b>Preparatory planning</b>	Come up with a solid meal plan during the first weeks (either alone or consulting a nutritionist)	<p>"If you just go with the flow and eat what is put in front of you it won't work. Having a plan like a solid one is very important"</p> <p>"I think it's very important to have a plan before anything else because these are big changes so I'm sure I might need some professional help like a nutritionist to help me follow a specific plan"</p>	12 (60)	6 (35.2)
	Search for healthy recipes on the internet (YouTube..)  Getting inspired from fitness accounts on Instagram	<p>"So maybe look for some healthy delicious recipes on YouTube. Also making sure they're not too time consuming just so that I can actually fit it in to my daily schedule"</p> <p>"loo</p>	0 (0)	9 ( 52.9)
	Clearing out cabinet of all temptations	"I'll start by emptying my cabinets in the kitchen of all the unhealthy processed foods and snacks"	5 (25)	4 (23.5)
	Gradually cutting out unhealthy items from the diet	<p>"Start slowly. Don't restrict yourself at all and just listen to your body"</p> <p>"</p>	13 (65)	10 (58.8)
	Join a monthly healthy meal subscription plan	<p>"maybe I will even subscribe to those healthy meals that deliver to your house"</p> <p>"subscribe to something like hello fresh. I think they already have all the ingredients in the box. Makes it easier to cook"</p>	2 ( 10)	5 (29.4)
<b>Coping planning</b>	Write a list of goals and reminders	"Remember my health goals and just wanting to live a better quality of life and be happy and satisfied I think a constant reminder of those things would easily help me and motivate me again so I won't give up"	7 (35)	7 (41)



Construct and sub-themes	Specific belief	Sample quotes	Frequency JORDAN (n=20)	Frequency UK (n= 17)
	Asking for support from family, friends, nutritionist..	<p>"I will ask my family for their support and make direct changes to our grocery shopping and the dishes we are used to cooking and maybe even join a gym you never know"</p> <p>"Definitely having the support of my family and people around me will help me I think and also just remembering my goals of becoming healthy and in shape"</p>	11 (55)	7 (41)
	Joining support groups and online forums	"Maybe join support groups you know like the ones on Facebook and Reddit, I think it's very important to have people that are likeminded and going through similar experiences to talk to"	0 (0)	5 (29.4)
	Joining a gym, start exercising	"I think like working out really helps because once you go to the gym and you realize how much effort it takes to burn just like 100 or 200 calories, you will think twice before eating something. "	2 (10)	5 (29.4)

## 4.4. Discussion

### 4.4.1. Pre-motivational Determinants: Knowledge and Risk Perception

This study applied the I-Change Model to explore socio-cognitive beliefs about healthy eating and eating in moderation among adults in the UK and Jordan. While participants from both groups demonstrated a shared understanding of healthy eating, such as the inclusion of fruits, vegetables, and lean proteins, there were notable differences in emphasis and cultural nuances. Jordanians highlighted dairy products, such as milk, yogurt, and white cheese, as integral to a healthy diet—a view absent among UK participants. This finding aligns with research emphasizing the Mediterranean influence on Jordanian dietary habits, where dairy forms a dietary staple and is associated with health benefits, particularly gut health and bone strength (Taha et al., 2021). Moreover, the cultural significance of traditional Jordanian meals like Mansaf, which heavily feature dairy products, highlights how dietary traditions shape health beliefs (ICH Jordan, n.d.). Conversely, UK participants emphasized reducing red meat consumption and

incorporating protein shakes and bars, reflecting Western dietary trends focused on sustainability and innovative protein sources (Willett et al., 2019; Sanchez-Sabate & Sabaté, 2019). Jordanians also favored olive oil as a healthier cooking alternative compared to corn oil, consistent with evidence suggesting olive oil's protective role against cardiovascular disease (Estruch et al., 2018).

In terms of risk perception, both groups were concerned about the long-term consequences of unhealthy eating, such as obesity and chronic diseases like diabetes and cardiovascular problems. However, the UK participants uniquely associated poor dietary habits with mental health outcomes, including irritability and low mood. This distinction aligns with studies linking dietary patterns to mental well-being, which have gained increasing public attention in Western countries (Jacka et al., 2014; Marx et al., 2021). The UK-specific focus on mental health may also stem from a growing awareness of psychological well-being as a component of healthy eating advice, as advocated by professional bodies like the British Dietetic Association (BDA, n.d.). Conversely, Jordanians did not report this belief, potentially reflecting cultural stigmas surrounding mental health or a lack of public awareness about this connection. These findings justify the need for region-specific quantitative instruments to ensure cultural relevance and capture distinct perceptions.

Another key observation was the frequency of beliefs related to structured eating patterns. Jordanians frequently emphasized the importance of scheduled meals and avoiding late dinners as key aspects of moderation, aligning with cultural norms prioritizing routine and family-centered meals. This preference resonates with research suggesting that traditional meal patterns often promote better metabolic outcomes in Middle Eastern cultures (Jalal et al., 2020). In contrast, these beliefs were mentioned less frequently in the UK, where cheat meals and calorie adjustments were more commonly associated with moderation, reflecting a more individualistic and flexible approach (Buckland et al., 2022). These differences highlight the role of cultural norms in shaping dietary habits and perceptions.

#### **4.4.2. Motivational Determinants: Advantages, Disadvantages, Self-Efficacy, and Social Influence**

Beliefs about the advantages of eating in moderation revealed both shared and region-specific motivations between UK and Jordanian participants. Both groups emphasized improved physical health and enhanced self-esteem as primary benefits. However, Jordanians frequently linked moderation to improved physical appearance and confidence, reflecting cultural pressures for aesthetic ideals. This aligns with research suggesting that appearance-related motivations are more salient in collectivist cultures, where social acceptance often hinges on physical appearance (Yu et al., 2022). Conversely, UK participants uniquely associated moderation with eliminating the need for strict dieting, reflecting a preference for flexibility and autonomy in dietary practices. This distinction mirrors findings in studies on dieting culture, which highlight Western trends emphasizing self-regulation and reducing the stress of rigid eating patterns (Williamson et al., 2015).

Regarding disadvantages, Jordanian participants frequently mentioned the challenges of attending social gatherings, such as family events or dining out. This reflects the social and communal nature of eating in Jordan, where traditional and celebratory meals often prioritize abundant, rich foods (Nakamura et al., 2020; ICH Jordan, n.d.). In contrast, UK participants predominantly reported time constraints as a barrier, aligning with the fast-paced nature of urban UK lifestyles and the convenience of pre-prepared, often less healthy, food options (Crawford et al., 2021).

The self-efficacy construct highlighted perceived challenges to eating healthily and in moderation. Both groups acknowledged difficulties in portion control, reflecting the widespread habit of consuming larger portions, especially at dinner. This aligns with findings from Western and Middle Eastern studies indicating that social norms and long-standing habits significantly influence portion sizes (Evers et al., 2022). Interestingly, Jordanian participants were more likely to report challenges related to insufficient knowledge about eating in moderation compared to UK participants. This suggests that in Jordan, the lack of accessible, clear guidelines on healthy eating practices may pose

a greater obstacle to behavior change. Supporting this, studies have shown that culturally tailored nutritional education significantly improves dietary habits in low- and middle-income countries (Delisle, 2010). A culturally specific barrier for Jordanians was the challenge of maintaining healthy eating habits during social gatherings, particularly during religious events such as Ramadan and Eid. Unlike the UK, where no participants mentioned this challenge, this finding reflects the prominence of communal meals in Jordanian culture. These meals often include rich, high-calorie dishes, making moderation more difficult (Elmadfa et al., 2021). Addressing this challenge would require public health initiatives that consider the cultural and religious significance of food traditions while promoting healthier alternatives.

Finally, The social influence construct captured beliefs about social norms, modeling, and support. Both groups agreed that people around them recognize the importance of eating healthily and in moderation, with similar frequencies reported in Jordan and the UK. However, fewer participants in Jordan compared to the UK mentioned that their family or social circle actively modeled healthy eating behaviors. This reflects findings that collectivist cultures, while emphasizing shared values, may not always translate awareness into action (Hofstede, 2011). Social support showed marked differences. In Jordan, participants reported feeling pressure from their social circles to conform to traditional eating patterns, such as consuming large portions or indulging in communal meals. In contrast, fewer UK participants mentioned such pressures. This aligns with findings that in collectivist societies, individuals may experience greater conflict between personal health goals and societal expectations (Ali et al., 2020). On the other hand, UK participants were more likely to report receiving support from close social circles compared to Jordanians. This highlights the growing role of individual-focused health interventions and peer support in Western contexts (Schueller et al., 2019).

#### ***4.4.3. Post-motivational Determinants: Action Planning and Coping Strategies***

Differences in planning strategies were particularly notable. UK participants frequently used digital tools, such as online recipe searches and fitness accounts, to support dietary planning. This aligns with findings that highlight the growing role of digital health tools in

promoting dietary behavior change in high-income countries (Schueller et al., 2019). In contrast, Jordanians placed greater emphasis on creating structured meal plans, often with professional guidance, reflecting a preference for traditional and personalized approaches to dietary planning.

Coping strategies also revealed cultural differences. While UK participants often mentioned joining online support groups and forums as a way to cope with dietary challenges, this approach was notably absent in Jordan. Instead, Jordanians relied heavily on family and community support to sustain dietary changes, aligning with collectivist cultural values that prioritize interpersonal relationships (Hofstede, 2011). Additionally, UK participants were more likely to mention gym memberships as a coping strategy, reflecting higher accessibility to fitness facilities compared to Jordan.

#### **4.5. Bridging to Chapters 5 and 6: The Quantitative Studies**

The findings from this qualitative study provide a critical foundation for the development of the quantitative studies presented in Chapters 5 and 6, which examine the socio-cognitive determinants of eating in moderation among adults in the UK and Jordan. While many core beliefs about healthy eating and eating in moderation were shared between the two populations, the analysis highlighted key cultural and contextual differences in knowledge, risk perception, motivational factors, and planning and coping strategies. These distinctions necessitate the design of separate quantitative studies for each population to ensure cultural relevance and accuracy in capturing region-specific beliefs. The qualitative findings underscored unique differences, such as Jordanians emphasizing the role of dairy products, structured meal times, and the challenges posed by social gatherings, while UK participants focused more on reducing red meat consumption, utilizing digital resources for dietary planning, and the influence of mental health on eating behaviors. These variations require tailoring the questionnaires to account for beliefs that are either absent or particularly salient in one context compared to the other. For example, items on the Jordanian questionnaire will include culturally specific constructs, such as the role of religious and communal meals in influencing eating behaviors, whereas the UK questionnaire will incorporate beliefs related to mental well-being and flexibility in

dietary practices. By tailoring the questionnaires to reflect these distinct beliefs, the research aims to capture the unique dietary behaviors and motivations within each context, thereby enhancing the accuracy and relevance of the quantitative studies. Despite these differences, the overall research framework, methodology, and constructs remain consistent across both studies, adhering to the same theoretical foundation and statistical analyses. This ensures comparability between the two contexts while respecting the cultural nuances identified in this chapter.

## **CHAPTER 5. IDENTIFYING SALIENT SOCIO-COGNITIVE DETERMINANTS AND BELIEFS TOWARDS EATING IN MODERATION IN ADULTS IN THE UK - A QUANTITATIVE STUDY USING THE I-CHANGE MODEL**

### **5.1. Introduction**

Obesity is prevalent in many parts of the world. The UK is particularly marked by the prevalence of obesity, which affects 74% and as many as 61% among men and women respectively (Hill & Peters, 1998). Likewise, the Middle East including Jordan has a significant burden of obesity. The changes in culture, society and globalization have greatly impacted eating attitudes as well habits especially for individuals who are young (Rolls et al., 2004).

Obesity is characterized by the fat accumulation in which there exists a general imbalance between calories consumed and those expended through physical activity and metabolism. However, in order to prepare effective prevention and intervention methods it is crucial first determine the complex interplay between energy overeating including both consuming high-energy dense foods or large proportions of food with different factors such culture lifestyle genetics and environment (de Vries et al., 2014; B. Swinburn et al., 1999).

Eating in moderation was defined as consuming a balanced, appropriately-sized amount of food (Hill & Peters, 1998). For the purpose of this study, it was operationally defined that moderate eating is calculated as the mean of daily intake energy from food products containing high calories. This technique involves limiting the consumption of energy-rich foods by portion control and snacking in a healthy manner. In fact, it ensures that energy intake and expenditure are balanced in order to prevent weight gain. Studies have reported the impact of moderation on several health indicators such as weight management, cardiovascular outcomes, and risk for diabetes (Hess, 2022). For example, Johnson et al. (2009) reported that a moderate fat and energy diet resulted in more weight

loss and better outcomes for cardiovascular risk factors as compared to the low-fat/low-energy group (Johnson et al., 2007). A further study revealed that moderate consumption, equivalent to number of eating occasions per day, was associated with lower body weight and Body Fat in the population (Aljuraiban et al., 2015). These results highlight the promise of eating moderately as an effective approach to reducing overweight and obesity, resulting in lower energy intake without subjectively increased hunger (Rolls et al., 2004). Despite the fact that research calls attention to the advantages of eating practice, aimed at preserving body weight and decreasing fat levels it does not imply that this method allows for quick loss as is observed with LCDs or VLCD. Lower calorie diets such as the LCD and VLCD entail a rapid initial weight loss (Bruci et al., 2020). Nevertheless, their limited nature makes them challenging to sustain over the long term and may lead to weight regain when normal eating habits are return (Camps et al., 2013). On the other hand, a moderate eating paradigm provides an equitable and lifelong strategy for managing weight (Kim, 2021). By promoting healthier eating habits that can be sustained over time, it reduces the chances of weight cycling or “yo-yo” dieting seen in strict diet programmes (Contreras et al., 2019). Moreover, it promotes the healthy relationship with food by giving flexibility and jubilation without starving one self.

To understand the success of ‘eating in moderation’ as a valid weight-loss strategy, it is important to analyze socio cognitive beliefs that greatly influence people about food consumption. Such factors such as self efficacy and attitude, include multiple psychological and social values that greatly influence moderation-based eating patterns of a person. Studies reported that self-sufficient people are more likely to avoid overeating, and they tend to make decisions regarding food (Deci, 2008). Furthermore, social support from one’s network and supports systems has shown to be a great contribution in adopting a healthier eating behavior. Support from others, positive social reinforcement and shared objectives might help increase an individual’s commitment to this method. However, counteractive social influences could discourage moderation (Greaney et al., 2017). Furthermore, attitudes and beliefs surrounding food, dieting, and body image influence one’s propensity to embrace moderation (Teixeira, Patrick & Mata, 2011). Addressing and possibly altering adverse or unrealistic views about these subjects is crucial for long-term achievement. Goal setting and planning also facilitate the adoption



of moderation-based eating behaviors. Setting realistic goals, coming up with ways to reach them and tracking adherence over time will help maintain this strategy (Pi-Sunyer, 2017). The socio-cognitive factors have proved to be guiding behaviour and the Integrative Cognitive Model (I-CM) gives an integrated perspective in understanding their dynamics. Examine how thoughts, emotions and social factors interact as elements of an individual's dietary preferences involving moderation. The human element, involving healthcare professionals and people looking to follow a moderation-oriented diet can utilise ICM for person oriented strategies based on psychosocial aspects of each individual. This holistic approach provides a more comprehensive analysis of factors that lead to the successful management of weight through eating practices moderation, which encourages increased effectiveness and sustainability.

The I-Change Model (I-CM) is an important framework through which to understand the sociocognitive mechanisms that underlie or are associated with moderation eating [20, 21, 23]. In the case of I-CM, demographic and biological attributes influence behavior indirectly through sociocognitive variables. Among these variables, awareness is of vital importance as it has proven to be a significant predictor in understanding sophisticated health behaviour like physical activity and nutrition. The knowledge of risk behaviours encourages people to consider change more than those that remain ignorant. As a result, the increase in awareness will lead to favorable behavioral changes [23].

Building on the findings from the previous qualitative study, which identified the beliefs of adults towards healthy eating and eating in moderation in the UK, the present study aims to identify the most salient socio-cognitive beliefs of adults towards eating in moderation in the United Kingdom. The ultimate goal is to develop a specific public health intervention program targeting these beliefs associated with eating in moderation. To achieve this objective, this study attempts to quantify the constructs of the I-Change Model, including knowledge, risk perception, attitudes, self efficacy, social influence, planning and intention.

## **5.2. Methods**

### ***5.2.1. Study design***

This is an online cross-sectional quantitative study of the socio-cognitive determinants towards healthy eating (eating in moderation) among adults in the UK. For the purpose of this study, the integrated change model, the I-Change Model (figure 3), was used as a theoretical model.

### ***5.2.2. Participant Eligibility, Recruitment Sample Size and Power***

The study targeted adult participants residing in the United Kingdom. The inclusion criteria consisted of all adults aged 18 years or more who lived in the United Kingdom and consented to participate through the electronic questionnaire. Pregnant women were excluded from participating. Participants were recruited through two primary methods: via an invitation ad posted on a social media platform (Facebook group) (Appendix L) and through the paid online platform Prolific.

The original target sample size was set at 300 participants. A power analysis was conducted using G\*Power, with parameters to detect a medium effect size, a power level of 0.80 and an alpha level of 0.05, indicating that a minimum of 200 participants would be sufficient for multiple linear regression analysis. After data cleaning and addressing eligibility criteria, the final sample size for this study consisted of 272 participants, exceeding the minimum requirement determined by the power analysis. This methodological approach ensured adequate statistical power, meeting the study's needs for detecting meaningful effects

### ***5.2.3. Ethical Considerations***

This study adhered to ethical guidelines to ensure participant privacy, confidentiality, and informed consent. Prior to data collection, ethical approval was obtained from [APPENDIX M]. The following measures were implemented to protect participants:

- **Informed Consent:** Participants received detailed study information through an online participant information sheet, outlining the study's objectives, procedures, potential risks, and benefits. Consent was obtained electronically before they proceeded with the questionnaire. [Appendix N]
- **Anonymity and Confidentiality:** All participant responses were anonymized. Identifying information, such as names or contact details, was not collected to maintain confidentiality. Data was securely stored and accessible only to the research team.
- **Sensitivity to Obesity-Related Issues:** Given the focus on eating behaviors and obesity, the study materials and survey questions were carefully designed to be sensitive to the potential emotional impact on participants. Language was selected to avoid stigma and to respect diverse perspectives on weight and health. Resources for mental health support were also included in the debrief form for participants who may have felt discomfort related to these topics. [Appendix O][Appendix P]
- **Right to Withdraw:** Participants were informed of their right to withdraw from the study at any point without consequence, and they could skip questions or discontinue participation at any time.
- **Debriefing:** Upon completing the questionnaire, participants were provided with a debrief form, which included information on how to contact the research team for follow-up questions or concerns and support resources if any discomfort was experienced during the study. [Appendix Q]

### **5.3. Measures and Instrument Development**

To design the study questionnaire, the findings of a recently conducted qualitative study of the beliefs about healthy eating behaviours among adults in the UK, and questionnaires from a similar study were used.

The I-Change model was used as a theoretical basis for the development of the online questionnaire. The questionnaire was designed to measure pre-motivational, motivational and post-motivational determinants of eating in moderation. These determinants included

knowledge about eating in moderation, eating in moderation and healthy eating risk perception, perceived advantages and disadvantages toward eating in moderation and healthy eating, social influence on adopting healthy eating behaviours, self-efficacy, and intentions to adopt a healthier eating lifestyle such as eating in moderation. A pilot was performed with twenty participants other than the study participants and according to its results, no necessary changes were needed. Factor analysis was conducted to assess the validity of the questionnaire for each construct of the I-Change model and Cronbach's alpha was calculated to ensure the internal consistency of the elements of each construct.

### ***5.3.1. Demographic Variables***

Participants were asked to provide their age (in years), sex (male = 0, female = 1, other = 2), highest level of formal education (low: none = 0, lower than high school = 1; medium: high school = 2, vocational/trade school = 3; high: university/technical college = 4, doctorate = 5), current living situation (alone = 0, with others = 1), and manually enter their height (cm / foot) and weight (kg/pounds).

### ***5.3.2. Eating in moderation Variables***

The questionnaire (Appendix R) used in this study consisted of two sections. The first section was to assess whether the participants ate in moderation or not. Eating in moderation was defined as "the average daily intake of energy from energy-dense food products". A low score means that a participant eats in moderation, whereas a high score indicates that a participant does not eat in moderation. This section of the questionnaire consisted of 42 questions sourced from a validated tool designed to measure fat intake. This questionnaire was then subsequently expanded to encompass broader dietary aspects, including sugar intake and ultra-processed foods. The expansion was guided by the definition of healthy eating by the World Health Organisation, aligning with their criteria for food items considered healthy. The food items included dairy products, sandwiches, dinner items, salty and sugary snacks and beverages. Each participant was queried about the frequency and quantity of consumption for these items, and, for certain products like meat and dairy, the type and portion size were also assessed. A scoring system was devised by multiplying the energy value of each product by its frequency and quantity. To

evaluate moderation in eating habits, a dichotomous variable was created using a median split: scores below the median indicated moderation, while scores above it denoted non moderation.

### ***5.3.3. I-Change Model Variables***

The I-Change Model variables was constructed using factors outlined in CHAPTER 4 , which explored the socio-cognitive beliefs of overweight and obese adults in the UK and Jordan. This section comprised a total of 57 questions. All psychosocial variables used a seven-point Likert scale, ranging from 1 (low) to 7 (high) to answer categories.

#### *5.3.3.1. Awareness factors*

##### *Knowledge*

To assess participants' knowledge of eating in moderation, 17 statements were included (Cronbach's alpha = 0.72). These statements encompassed concepts such as "Eating in moderation is defined as including more protein and fewer carbohydrates in my diet" and "Eating in moderation is defined as eating three separate meals during the day." The participants responded to each statement as true, false, or not sure. The correct responses were coded as 1, while the incorrect or unsure responses were coded as 0. Higher mean scores indicated greater knowledge of eating in moderation, while lower mean scores indicated limited knowledge.

The construct validity was assessed through the standard process of factor analysis through dimensional reduction in the SPSS (data reduction) and Microsoft Excel (sum of square technique). With the value of 0.774, the grouping of items showed acceptable value of discriminant and construct validity.

##### *Risk Perception*

The perceived risk associated with not eating in moderation was measured using eight items (Cronbach's alpha = 0.83). Participants were asked to rate their agreement with statements such as "I believe that the risk of not eating in moderation will cause weight gain" and "I believe that the risk of not eating in moderation will cause physical health

diseases” Response options ranged from 1 (strongly disagree) to 7 (strongly agree), with higher mean scores indicating greater perceived risk. The construct validity was assessed through the standard process of factor analysis through dimensional reduction in the SPSS (data reduction) and Microsoft Excel (sum of square technique). With the value of 0.779, the grouping of items showed acceptable value of discriminant and construct validity.

#### *5.3.3.2. ICM Motivational Factors*

##### *Attitude*

Attitudes toward moderation eating were assessed using seven statements (Cronbach's alpha = 0.78), including advantages such as (“Eating in moderation is important to me” and “I enjoy eating in moderation” ) and disadvantages such as (“eating in moderation makes me think too much about my food choices.”). Participants rated their agreement on a seven-point scale, with higher mean scores indicating more positive attitudes. The construct validity was assessed through the standard process of factor analysis through dimensional reduction in the SPSS (data reduction) and Microsoft Excel (sum of square technique). With the value of 0.771, the grouping of items showed acceptable value of discriminant and construct validity.

##### *Social Influence*

Social influences were evaluated using six items (Cronbach's alpha = 0.68). Statements such as “People around me encourage me to eat in moderation” and “I feel pressure from my family to eat in moderation” were presented, with participants rating their agreement on a seven-point scale. Higher mean scores indicated stronger social influences. Means were computed for cases with at least two valid values for individual factors of social influence. The construct validity was assessed through the standard process of factor analysis through dimensional reduction in the SPSS (data reduction) and Microsoft Excel (sum of square technique). With the value of 0.816, the grouping of items showed acceptable value of discriminant and construct validity.

### *Self efficacy*

Perceived behavioral control of eating in moderation was measured using six items (Cronbach's  $\alpha = 0.79$ ). Participants were asked to rate their agreement with statements such as "I have control over my eating in moderation" and "I find it easy to eat in moderation in social situations." Responses were recorded on a seven-point scale, with higher mean scores indicating greater perceived control. The construct validity was assessed through the standard process of factor analysis through dimensional reduction in the SPSS (data reduction) and Microsoft Excel (sum of square technique). With the value of 0.766, the grouping of items showed acceptable value of discriminant and construct validity.

### *Intention*

Intention to eat in moderation was assessed using four items (Cronbach's  $\alpha = 0.81$ ), including "I intend to eat in moderation in the next month" and "I will make an effort to eat in moderation." Participants rated their intention on a seven-point scale, with higher mean scores indicating stronger intentions. The construct validity was assessed through the standard process of factor analysis through dimensional reduction in the SPSS (data reduction) and Microsoft Excel (sum of square technique). With the value of 0.759, the grouping of items showed acceptable value of discriminant and construct validity.

### *Action Plans*

Participants were asked to indicate whether they intended to implement nine eating-in-moderation plans over the next month using a True/False answer format. Plans corresponded to eating in moderation related actions such as practicing noticing when one is hungry or full and setting oneself reminders to eat mindfully (e.g., on a phone or through post-it notes). A mean score was computed from the corresponding answers ( $\alpha = 0.78$ ).

## 5.4. Procedure

Data collection began from the 1st of December 2022 and ended on the 15<sup>th</sup> of December 2022, all participants received complete information on the study through a participant information sheet, a debrief form, and a risk assessment form. These forms provided a complete description of the study and its objectives and provided the participants with access instructions regarding the online questionnaire. Informed consent was obtained prior to participation. The participants were then directed to an online questionnaire hosted on Qualtrics in which they were requested to respond through their smartphones, laptops, or computers and answer all the questions. To preserve student privacy and confidentiality, participants' identifiers, such as their names and phone numbers, were not included in the questionnaire. On average, it took approximately 20 minutes to complete the questionnaire, with the option to skip questions and save progress for later completion.

## 5.5. Data Analysis

The data analysis was performed using SPSS version 29 compatible with mac iOS, and a significance level ( $\alpha$ ) of 0.05 was used for two-tailed analyses. A test for missing completely at random (MCAR) by Little [50] indicated that the missing values occurred randomly ( $\chi^2 (867) = 103.71, p = 1.00$ ). To handle missing values, expectation maximisation was used separately for the two groups of eating in moderation (EIM) to minimise bias in parameter estimates and ensure the power of subsequent analyses [51, 52]. An option 'does not apply' (= 999) was provided for the responses of the participants and recoded as a blank after calculating the missing value.

Univariate outliers were identified using z scores; while multivariate outliers were identified using Mahalanobis distance. Participants were classified into two groups based on percentiles corresponding to the mean score of engagement frequency in eating in moderation: Eating in moderation and not currently eating in moderation. Descriptive statistics, including means and standard deviations, were used to examine I- ICM variables, aspects of moderation eating, and percentages for categorical characteristics of the participants. Multivariate analyses of variance (MANOVAs) were pre-specified to



test for differences among the two groups on individual I-CM items per factor. Tukey-adjusted pairwise comparisons were conducted for I-CM construct means and individual items using univariate analysis of variance (MANOVAs). A multiple linear regression analysis with stepwise forward selection ( $p = 0.05$ ) was performed to assess the fit of the model and identify variables uniquely associated with the moderation behaviour of eating. Eating in moderation behaviour was entered as the dependent variable, and the I-CM constructs were entered blockwise to examine the relative importance of predisposing factors (demographic and eating in moderation-related factors in Model 1), awareness factors (Model 2), motivation factors (Model 3), intention (Model 4) and action planning (Model 5).

This study employed two complementary statistical techniques: multivariate analysis of variance (MANOVA) and multiple linear regression, chosen for their distinct yet interconnected strengths in addressing the research objectives. MANOVA was used to identify the most salient beliefs within each construct of the I-Change Model by examining differences between individuals who eat in moderation and those who do not. This method simultaneously analyses multiple dependent variables (beliefs), reducing the likelihood of Type I error that arises from performing separate univariate tests. For example, MANOVA was used to evaluate whether beliefs about risk perception, self-efficacy, or social influence differed significantly between the two groups. These findings provide critical insights into the socio-cognitive factors that distinguish individuals who engage in eating in moderation from those who do not.

Multiple linear regression, on the other hand, was employed to identify which determinants directly predict eating in moderation. This technique quantifies the relationship between socio-cognitive determinants (such as attitudes, risk perception, and self-efficacy) and eating in moderation, allowing for the assessment of the relative importance of each predictor. Regression analysis thereby highlights the most influential determinants, offering actionable insights for designing targeted public health interventions. For example, if self-efficacy emerges as a significant predictor, interventions could prioritize building individuals' confidence in their ability to eat in moderation. These methods were selected to build on the findings from the qualitative

phase of this research, which informed the development of constructs and beliefs to be tested quantitatively. MANOVA identified the most salient beliefs within each construct, while regression pinpointed the determinants that directly influence eating in moderation, ensuring a comprehensive understanding of the socio-cognitive influences on behavior. This approach aligns with the qualitative and quantitative integration framework described by Cheung et al. (2023).

By combining these statistical approaches, this study ensures a comprehensive understanding of the socio-cognitive determinants of eating in moderation, highlighting both group-level differences in beliefs and the individual-level predictors of behavior. This dual approach ensures the findings are not only descriptive but also actionable, facilitating the design of public health interventions tailored to the cultural contexts of the UK and Jordan.

To provide clarity on the regression analysis, several key statistical terms are defined as follows:

- R (correlation coefficient) indicates the strength and direction of the relationship between predictors and the outcome variable.
- R-squared quantifies the proportion of variance in the dependent variable (eating in moderation) explained by the independent variables, while adjusted R-squared corrects for the number of predictors to provide a more accurate measure of model fit.
- The F-statistic evaluates the overall significance of the regression model, testing whether the model provides a better fit than one with no predictors.
- P-values assess the statistical significance of individual predictors, with smaller values indicating stronger evidence against the null hypothesis.

## 5.6. Results

### 5.6.1. Demographic Results

Among the participants, 31.6% identified as male ( $n = 68$ ), 67.7% identified as female ( $n = 146$ ), and less than 1% identified outside of the binary categories ( $n = 1$ ). The mean age of the respondents was 35.21 years ( $SD = 17.19$ ). Furthermore, 29.0% of the participants had a school level education a low level of education, 38.3% had an undergraduate level education, and 32.7% had a graduate level education. The mean BMI was 27.2 ( $SD = 5.0$ ) where 19.8 % were obese, 38.2% were overweight and 43 % had a healthy weight.

### 5.6.2. Group Differences on I-CM Constructs

A summary of group means and MANOVA statistics per construct are displayed in Table 8.

#### 5.6.2.1. Eating in moderation

The average daily intake of the energy-dense food products was 946.4 kilocalories (kcal ( $SD = 413.3$ , range = 170.3–2272.3). The categories of sweet and savoury snacks, sandwiches and fillings and hot and cold beverages were the most important sources for high energy intake. Dairy products, food at dinner and alcohol contributed the least to the energy intake from energy-dense foods.

#### 5.6.2.2. Awareness factors - Risk perception construct

A multivariate analysis of variance (MANOVA) was performed to examine the effect of the eating category (Not Eating in moderation vs. eating in moderation) on perceived risk beliefs related to eating behavior. The results revealed a statistically significant multivariate effect for the the eating category, Pillai's trace = 0.038,  $F(6, 265) = 2.268$ ,  $p = 0.038$ , with a small effect size, partial eta squared = 0.049. This indicates that there is a significant difference in the beliefs about beliefs about risk perception between the two categories of eating. The Wilks' Lambda test ( $\Lambda = 0.951$ ) also supports this finding. These

results suggest that the eating category of individuals has a significant impact on their beliefs about risk perception related to eating behavior.

Further univariate tests indicated significant effects on belief in the risk of weight gain ( $F(1, 270) = 11.857, p = .0001, \text{partial eta squared} = 0.042$ ), the risk of developing mental health issues ( $F(1, 270) = 6.270, p = .013, \text{partial eta squared} = 0.023$ ), the risk of developing low energy levels ( $F(1, 270) = 5.164, p = 0.024, \text{partial eta squared} = 0.019$ ) and the risk of developing physical health problems ( $F(1, 270) = 11.453, p = 0.001, \text{partial eta squared} = 0.041$ ). However, there was no significant effect on the belief in the perceived risks associated with the risk of physical appearance concerns ( $F(1, 270) = 2.097, p = 0.149, \text{partial eta squared} = 0.008$ ).

These results suggest that people who report eating in moderation exhibit higher beliefs related to the perceived risk of not eating in moderation compared to those who do not eat in moderation, especially in terms of their belief in the risk of weight gain, developing mental health issues, developing low energy levels, and developing physical health issues.

**Table 12. Differences in beliefs between the respondents: RISK PERCEPTION**

Differences in beliefs between *the respondents by eating group; Eating in moderation vs. Not eating in moderation*; Awareness (Risk perception); 1 = strongly disagree, 7 = strongly agree. \*:  $P < 0.05$

Belief	Not Eating in Moderation Mean (SD)	Eating in Moderation Mean (SD)	p-value	Partial $\eta^2$
Eating in moderation will reduce my risk of weight gain	5.51 (1.53)	6.07 (1.65)	<0.01	0.042
Eating in moderation will reduce my risk of developing physical health issues	5.61 (1.50)	6.17 (1.64)	<0.01	0.041
Eating in moderation will lower my risk of developing mental health issues	4.62 (1.62)	5.07 (1.86)	0.013	0.023
Eating in moderation will reduce my risk of developing low levels of energy	5.33 (1.82)	5.57 (1.63)	0.024	0.019
Eating in moderation will reduce my risk of being concerned with my physical appearance	5.20 (1.83)	5.57 (1.63)	0.149	0.008

#### 5.6.2.3. Motivational factors - Attitude construct

A multivariate analysis of variance (MANOVA) was performed to examine the effect of the eating category (Not Eating in Moderation vs. Eating in Moderation) on perceived advantages and disadvantages related to eating behaviour. The results revealed a statistically significant multivariate effect for the eating category, Pillai's trace = 0.061,  $F(1, 270) = 2.105$ ,  $p = 0.019$ , with a medium effect size, partial eta squared = 0.061. This indicates that there is a significant difference in the beliefs about risk perception between the two categories of eating. The Wilks Lambda test ( $\Lambda = 0.939$ ) also supports this finding. These results suggest that the eating category of individuals has a significant impact on their beliefs about risk perception related to eating behaviour.

Further univariate tests indicated significant effects for the belief in the advantages related to improving overall health and well-being ( $F(1, 270) = 9.071, p < 0.01$ , partial eta squared = 0.033) and the belief in the advantages related to improving self-esteem ( $F(1, 270) = 4.086, p = 0.044$ , partial eta squared = 0.150), the belief in the advantages related to making healthier food choices ( $F(1, 270) = 5.766, p = 0.017$ , partial eta squared = 0.021) and the belief in the advantages related to feeling more in control of one's eating habits ( $F(1, 270) = 6.406, p = 0.012$  and partial eta squared = 0.023). However, there was no significant effect on the belief in the advantages related to enhancing one's physical appearance ( $F(1, 270) = 1.603, p = .207$ , partial eta squared = 0.006) and the elimination of the need to go on a diet ( $F(1, 270) = 2.110, p = 0.147$ , partial eta squared = 0.008). These results suggest that people who report eating in moderation exhibit higher beliefs related to perceived advantages related to their eating behaviour compared to those who do not eat in moderation, especially in terms of improving overall health and well-being, improving self-esteem, making food choices more healthy,, and feeling more in control of eating habits.

Results related to examining perceived disadvantages were also reported. The results indicated significant group differences in the participants' perceptions of certain disadvantages; Pillai's trace = 0.056,  $F(1, 270) = 2.235, p = 0.032$ , with a medium effect size, partial eta squared = 0.60. This indicates that there is a significant difference in the beliefs related to perceived disadvantages between the two eating categories. The Wilks' Lambda test ( $\Lambda = 0.944$ ) also supports this finding. These results suggest that the eating category of people has a significant impact on their beliefs about perceived disadvantages related to eating behaviour.

Further univariate tests indicated significant effects for the belief that the disadvantage of eating in moderation is too time consuming ( $F(1, 270) = 6.461, p = 0.012$ , partial eta squared = 0.230) and the belief that eating in moderation makes one feel guilty about their current eating habits ( $F(1, 270) = 4.128, p = 0.043$ , partial eta squared = 0.150), the belief that the disadvantage of eating in moderation is too financially expensive ( $F(1, 270) = 6.062, p = .014$ , partial eta squared = 0.022) and the belief in the disadvantage of eating in moderation makes it more challenging to order food through delivery apps ( $F(1, 270)$

= 5.317,  $p = 0.022$ , partial eta squared = 0.019). However, there was no significant effect on the belief in the disadvantages related to eating in moderation preventing one from eating whatever they craved ( $F(1, 270) = 0.268$ ,  $p = 0.605$ , partial eta squared = 0.001), and making grocery shopping more difficult ( $F(1, 270) = 0.097$ ,  $p = 0.756$ , partial eta squared = 0.001).

**Table 13. Differences in beliefs between the respondents by Eating group**

*Eating in moderation-vs- Not eating in moderation; Motivational factors; 1 = strongly disagree, 7 = strongly agree. (Advantages, Disadvantages)*

Belief	Not Eating in Moderation Mean (SD)	Eating in Moderation Mean (SD)	p-value	Partial $\eta^2$
Eating in moderation will improve my overall health and well-being	5.66 (1.58)	6.11 (1.83)	<0.01	0.033
Eating in moderation will improve my mental health and self-esteem	5.25 (1.12)	5.39 (1.80)	0.044	0.021
Eating in moderation will help me feel more in control of my eating habits	5.34 (1.67)	5.39 (1.80)	0.012	0.023
Eating in moderation will improve my physical appearance	4.62 (1.87)	4.13 (1.67)	0.207	0.006
Eating in moderation will eliminate the need to go on a diet	4.10 (1.73)	4.13 (1.66)	0.147	0.008
Eating in moderation will help me make healthier food choices	5.34 (1.67)	5.39 (1.80)	0.017	0.021
Eating in moderation will prevent eating whatever I want	4.89 (1.90)	4.15 (1.58)	0.605	0.001
Eating in moderation will be too time-consuming	4.62 (1.87)	4.13 (1.67)	0.012	0.23
Eating in moderation will make me feel guilty about current eating habits	4.23 (1.95)	3.98 (1.77)	0.043	0.15

Belief	Not Eating in Moderation Mean (SD)	Eating in Moderation Mean (SD)	p-value	Partial $\eta^2$
Eating in moderation will be financially expensive	4.49 (1.97)	4.00 (1.95)	0.014	0.022
Eating in moderation will make grocery shopping difficult	4.49 (1.88)	3.98 (1.69)	0.756	0.001
Eating in moderation will make it more difficult to order food through delivery apps/restaurants	4.62 (1.87)	4.13 (1.66)	0.022	0.019

#### 5.6.2.4. Social Influence Construct

A multivariate analysis of variance (MANOVA) was performed to examine the effect of the eating category (Not eating in moderation versus eating in Moderation) on the beliefs related to social influence related to eating behavior. The results revealed a statistically significant multivariate effect for the eating category, Pillai trace = 0.035,  $F(1,270) = 3.259$ ,  $p = 0.022$ , with a small effect size, partial eta squared = 0.035. This indicates that there is a significant difference in social influence beliefs between the two eating categories. The Wilks Lambda test ( $\Lambda = 0.965$ ) also supports this finding. These results suggest that individuals' eating category has a significant impact on their social influence beliefs related to eating behavior.

Further univariate tests indicated significant effects for the subjective norm belief in that most people in one's life believe that eating in moderation is important ( $F(1, 270) = 4.075$ ,  $p = 0.002$ , partial eta squared = 0.034). However, there was no significant effect on the belief in social modelling; 'Most people in my life already eat in moderation' ( $F(1,270) = 2.076$ ,  $p=0.151$  and partial eta squared = 0.008 and social support: 'Most people in my life encourage and support me to eat in moderation'  $F(1,270)= 1.492$ ,  $p= 0.223$  and partial eta squared= 0.005.

These results suggest that individuals who report eating in moderation exhibit higher beliefs related to social influence (specifically subjective norm), compared to those who do not eat in moderation.



**Table 14. Differences in beliefs between the respondents by Eating group**

*Eating in moderation-vs- Not eating in moderation*; Motivational factors; 1 = strongly disagree, 7 = strongly agree. (Social Influence):

Belief	Not Eating in Moderation Mean (SD)	Eating in Moderation Mean (SD)	p-value	Partial $\eta^2$
Most people in my life believe that eating in moderation is important (Social Norms)	4.93 (1.20)	5.39 (1.80)	0.002	0.034
Most people in my life already eat in moderation (Social Modelling)	4.89 (1.08)	4.13 (1.67)	0.151	0.008
Most people in my life encourage and support me to eat in moderation (Social Support)	4.39 (1.47)	4.08 (1.52)	0.223	0.005

#### 5.6.2.5. Self-efficacy construct

A multivariate analysis of variance (MANOVA) was conducted to examine the effect of eating category (Not Eating in Moderation vs. Eating in Moderation) on self-efficacy beliefs related to eating behavior. The results revealed a statistically significant multivariate effect for eating category, Pillai's Trace = 0.038,  $F(3, 268) = 3.537$ ,  $p = 0.015$ , with a small effect size, partial eta squared = 0.038. This indicates that there is a significant difference in the self-efficacy beliefs between the two eating categories. The Wilks' Lambda test ( $\Lambda = 0.962$ ) also supports this finding. These results suggest that individuals' eating category has a significant impact on their self-efficacy beliefs related to eating behavior.

Further, univariate tests indicated significant effects for the belief in easily eating in moderation in general ( $F(1, 270) = 4.075$ ,  $p = .044$ , partial eta squared = 0.015) and the belief in easily eating in moderation with the current knowledge one has ( $F(1, 270) = 6.747$ ,  $p = .010$ , partial eta squared = 0.024). However, there was no significant effect on the belief in easily eating in moderation by eating smaller portions ( $F(1, 270) = 0.034$ ,  $p = .854$ , partial eta squared = 0.001). These results suggest that individuals who report not

eating in moderation exhibit lower self-efficacy and find it more challenging to eat in moderation in general and find it more challenging to eat in moderation with the current knowledge they have.

**Table 15. Differences in beliefs between the respondents by Eating group**

*Eating in moderation-vs- Not eating in moderation*; Motivational factors; 1 = strongly disagree, 7 = strongly agree. (Self-efficacy):

Belief	Not Eating in Moderation Mean (SD)	Eating in Moderation Mean (SD)	p-value	Partial $\eta^2$
I can easily eat in moderation in general	4.28 (1.70)	4.89 (1.08)	0.044	0.015
I can easily eat in moderation with the knowledge I have	4.13 (1.67)	4.73 (1.51)	0.010	0.024
I find it challenging to eat smaller portions	4.46 (1.97)	4.62 (1.87)	0.854	0.001

## 5.7. Multiple Linear Regression

A multiple linear regression analysis was conducted to evaluate the relationship between the independent variables (Age, Gender, Knowledge, Risk Perception, Advantages, Disadvantages, Social Influence, Planning, Intention, and Self-Efficacy) and the dependent variable, Total Energy Intake. The overall model was statistically significant,  $F(10, 261) = 6.401$ ,  $p < 0.001$ , explaining 19.6% of the variance in Total Energy Intake ( $R^2 = 0.196$ ; Adjusted  $R^2 = 0.168$ ). The regression coefficients indicated that significant predictors of Total Energy Intake included Age ( $B = -709.428$ ,  $t = -2.787$ ,  $p = 0.006$ ), Risk Perception ( $B = -78.363$ ,  $t = -2.157$ ,  $p = 0.032$ ), Advantages ( $B = 14.532$ ,  $t = 0.417$ ,  $p = 0.031$ ), Disadvantages ( $B = 99.328$ ,  $t = 3.925$ ,  $p < 0.001$ ), and Intention ( $B = -2053.290$ ,  $t = -3.909$ ,  $p < 0.001$ ). Other predictors, including Gender, Knowledge, Social Influence, Planning, and Self-Efficacy, did not significantly contribute to the model.

This distinction between significant and non-significant predictors provides insight into which socio-cognitive factors may be most influential for interventions aiming to reduce energy intake (promote eating in moderation). The significant predictors, particularly intention, perceived disadvantages, and risk perception, appear to have the most substantial effects on dietary moderation within this sample, while factors such as knowledge and self-efficacy showed limited predictive power in this specific analysis.

**Table 16. Multiple linear regression**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.443	0.196	0.168	2847.37

Predictors: (Constant), Intention, Advantages, Disadvantages, Age, Gender, Social Influence, Risk Perception, Planning, Knowledge, Self-Efficacy

In terms of the Model Summary, this regression model shows a good fit as per Durbin-Watson, and the analysis is deemed significant by the regression model supported by Downie and Heath (1970). The degree of correlation on R and R Square has been found moderate and low consecutively, i.e., 0.443 and 0.196.

**Table 17. ANOVA**

Model	Source	Sum of Squares	df	Mean Square	F / Sig.
1	Regression	520,400,000	10	52,040,000	6.401 / 0.000
	Residual	2,122,000,000	261	8,130,000	
	Total	2,642,000,000	271		

a. Predictors: (Constant), Intention, Advantages, Disadvantages, Age, Gender, Social Influence, Risk Perception, Planning, Knowledge, Self-Efficacy

b. Dependent Variable: Total Energy Intake

A significant correlation on multiple regression ( $F = 6.401$ ,  $p = 0.000$ ) has been found between intention, advantages, disadvantages, age, gender, social influence, self-efficacy, risk perception, planning, and knowledge (as independent variables) and total energy intake (as the dependent variable).

**Table 18. Model Coefficients**

Predictor	B (Unstd.)	Std. Error	Beta (Std.)	t-value	p-value
(Constant)	12,023.597	1632.787		7.364	0.000
Age	-709.428	254.531	-0.150	-2.787	0.006
Gender	-265.532	389.520	-0.015	-0.682	0.496
Knowledge	-91.580	70.939	-0.089	-1.291	0.198
Risk Perception	-78.363	36.329	-0.186	-2.157	0.032
Advantages	14.532	34.827	0.075	0.417	0.031
Disadvantages	99.328	25.309	0.245	3.925	0.000
Social Influence	-54.995	52.222	-0.108	-1.053	0.293
Planning	126.517	90.902	0.090	1.392	0.165
Intention	-2053.290	525.242	-0.228	-3.909	0.000
Self-Efficacy	-2.206	3.055	-0.030	-0.722	0.471

**Table 19. Predictor Summary Table for Multiple Linear Regression**

Predictor	B (Unstd.)	Std. Error	Beta (Std.)	t-value	p-value
(Constant)	12023.597	1632.787		7.364	0.0
Age	-709.428	254.531	-0.15	-2.787	0.006
Gender	-265.532	389.52	-0.015	-0.682	0.496
Knowledge	-91.58	70.939	-0.089	-1.291	0.198
Risk Perception	-78.363	36.329	-0.186	-2.157	0.032
Advantages	14.532	34.827	0.075	0.417	0.031
Disadvantages	99.328	25.309	0.245	3.925	0.0
Social Influence	-54.995	52.222	-0.108	-1.053	0.293
Planning	126.517	90.902	0.09	1.392	0.165
Intention	-2053.29	525.242	-0.228	-3.909	0.0
Self-Efficacy	-2.206	3.055	-0.03	-0.722	0.471

## 5.8. Discussion

This research aimed to explore the complex nature of eating behavior that highlighted moderation. The findings showed a complicated network of subtle links between individuals' attitudes, perceptions and their dietary decisions. Analysis of the results showed that almost all pre-motivational, motivational, and post motivators to consuming in moderation from ICM [27] differed significantly between people with low versus high frequency level engagement.

Those who moderated in the eating behaviors demonstrated magnified risk perceptions, such as a weight gain and numerous health complications. Moreover, positive attitudes to moderation had significant correlations with beliefs associated with greater health in general, higher levels of self worth and control over nutrition-related habits. The social domain was also influential, with subjective norms making a major difference in food choices and the role of societies on eating habits. In addition, self-efficacy beliefs proved to be a major predictor as people who believed they would manage moderately displayed improved dietary behavior. After motivational factors such as intention and planning skills were shown to make significant contributions in predicting energy intake that helped understand the complexity of dietary choices. These indicators and attributes are woven into the theories on nutrition, behavior, and social learning. A multifaceted set of explanations are theorized by researchers to explain eating behaviors. Among many theoretical implications, I-change model is one the notable and relevant theories. This study is framed under and guided by I-change model which provides an array of attributes to explain eating behaviors. The model initially frames eating behaviors under knowledge about food and eating and then the risks associated with food intake and eating behaviors [27]. The risk perception is a broader domain of variables explaining food intake and eating behaviors, for example, weight gain, mental health issues and chronic health issues. Lappalainen et al. asserts that knowledge and perceived risk impacts the dietary behaviors of an individual. This theory is based on a simple assumption i.e., having more knowledge about the risk of overeating leads to moderate eating behaviors. Studies have supported this assumption. In Holland, a study found that those who eat in moderation are more aware of the repercussions of food intake [55]. In addition, a study showed that

exercise related behaviors were also impacted by knowledge and risk perception about food intake.

The regression analysis identified risk perception, advantages, disadvantages, and age as significant predictors of eating in moderation. Specifically: Risk perception: Individuals who perceived higher health risks associated with unhealthy eating were more likely to engage in moderation, underscoring the role of awareness in motivating behavior change. This aligns with research that suggests awareness of adverse health outcomes, like chronic diseases, can be a powerful motivator for adopting healthier eating habits (Brug et al., 2006; Schwarzer, 2008). Age: Older participants were more likely to report eating in moderation, potentially reflecting differences in life-stage priorities, dietary habits, or health awareness. This finding is consistent with age-related changes such as slower metabolism, reduced physical activity levels, and hormonal adjustments that often decrease appetite and overall caloric needs (Shlisky et al., 2017; Roberts & Rosenberg, 2006). These factors, combined with the cultural influence of healthier dietary habits often adopted with age, may contribute to a natural moderation in eating behaviors as individuals grow older. Advantages and disadvantages: Positive attitudes towards the benefits of moderation (e.g., improved health and well-being) were associated with greater adherence to this behavior. Conversely, perceived disadvantages, such as concerns about time or financial costs, were barriers to moderation. Highlighting perceived disadvantages of not eating in moderation as a predictor reinforces the idea that individuals who view moderation as beneficial and non-restrictive are more likely to consume fewer calories. Qualitative data from Chapter 4 illustrate that participants often associate moderation with improved energy levels, weight management, and a reduced risk of health complications, emphasizing the value of interventions that highlight these benefits.

These findings highlight the practical significance of targeting risk perception and attitudes in intervention programs. For instance, campaigns could emphasize the tangible health benefits of moderation while addressing misconceptions about its feasibility or cost.

Notably, some determinants—such as self-efficacy and social influence—were not significant predictors of eating in moderation. When examining the influence of self-efficacy within the broader multiple linear regression model (Table 10), self-efficacy did not emerge as a statistically significant predictor of total energy intake ( $\beta = -1.556$ ,  $p = 0.598$ ). However, the analysis of differences in beliefs about self-efficacy between those eating in moderation and those not (as presented in Table 9) revealed statistically significant differences. Participants who eat in moderation believe more strongly in their ability to do so, as indicated by the significant p-values (0.044 and 0.010) for beliefs such as 'I can easily eat in moderation' and 'eating in moderation with my current knowledge is challenging.' This suggests that self-efficacy beliefs differ between groups and are pertinent to understanding eating behaviours. This apparent contradiction between the MANOVA and regression analyses highlights the complex role self-efficacy plays in dietary behaviour. In the regression model, the effect of self-efficacy might be overshadowed by more potent predictors such as age, risk perception, and attitudes, suggesting that while self-efficacy is relevant, it does not independently predict dietary outcomes when considered alongside a range of socio-cognitive determinants.

This could suggest that these factors, while important in other contexts, may have a weaker direct influence on dietary behaviours when controlling for other variables. However, the MANOVA results revealed group differences in these beliefs, indicating that they may still play an indirect or contextual role in shaping behaviour. Future research should explore these dynamics further to understand their potential mediating effects; for example, future studies might examine whether the impact of self-efficacy on eating habits is mediated by factors like dietary knowledge or social support. Additionally, the context-specific measures of self-efficacy, especially tailored to the challenges of eating in moderation within the UK, could provide deeper insights into how this construct affects behaviour. It might also be beneficial to consider cultural and environmental influences that could alter the significance of self-efficacy in dietary behaviour. In conclusion, together, the regression and MANOVA findings provide a nuanced understanding of the socio-cognitive determinants of eating in moderation, with direct implications for designing effective, theory-driven public health interventions.

## 5.9. Summary and Transition to Chapter 6

Chapter 5 provided a detailed examination of the socio-cognitive determinants influencing dietary moderation behaviours within the UK context, using the I-Change Model as the guiding theoretical framework. The findings revealed that risk perception, attitudes, and age significantly influenced dietary moderation, while constructs such as self-efficacy and social influence showed limited direct predictive power on total energy intake. These insights offer a nuanced understanding of the socio-cognitive mechanisms driving dietary behaviours in the UK, laying the groundwork for further exploration in other cultural settings.

Building on these findings, Chapter 6 shifts the focus to Jordan, where the socio-cognitive determinants of dietary moderation are examined within a distinct cultural context. This decision stems from the qualitative findings in Chapter 4, which revealed significant differences in the specific beliefs forming the constructs of the I-Change Model between the UK and Jordan. For example, while the attitude construct is common to both populations, the specific beliefs that shape attitudes differ—such as beliefs emphasizing family obligations and community health in Jordan versus personal convenience and long-term health in the UK.

These cultural differences in beliefs necessitated the adaptation of the questionnaire used in the UK study to reflect the Jordanian context. Chapter 6 employs the same quantitative methodology, statistical analysis, and theoretical framework as in the UK study, but with adjustments to account for these culturally specific beliefs. By doing so, this chapter aims to identify the socio-cognitive determinants of dietary moderation in Jordan and compare them to those identified in the UK. This comparative analysis provides valuable insights into how cultural context influences health-related decision-making and informs the development of culturally tailored public health interventions.



## CHAPTER 6. IDENTIFYING SALIENT SOCIO-COGNITIVE DETERMINANTS AND BELIEFS TOWARDS EATING IN MODERATION IN ADULTS IN JORDAN- A QUANTITATIVE STUDY USING THE I-CHANGE MODEL

### 6.1. Introduction

Obesity has become an increasingly serious health issue, which affects a large number of the world's population, while some areas carry more weight than others. In these areas, the Middle East inclusive of Jordan continues to battle with an explosion in obesity levels. This mirror is a reflection in the UK, where about 74% of men and 61% of women are overweight or obese. [Abdelaal M et al., 2017, Dai H., Alsalhe et al., 2020].

Obesity is not an epidemic on its own but is associated with the cultural, social and economic transformations. Eating attitudes and behaviours have changed significantly due to globalization of food markets, sedentary life style, changes in culture norms and values [Lee A et al.,2019]. These changes have been most notable among the younger generation, evidence of a demographic shift in obesity rates.

Obesity epidemic is not just a consequence of increased calorie intake alone; rather it is a complex public health challenge involving diversity of dynamics. Such factors include socio-cultural and lifestyle influence, hereditary predisposition as well as environmental influences [Henry FJ et al.,2011, Misra A et al.,2011, Peeters Aet al., 2003]. Subsequently, it is of fundamental significance to lay out coordinated comprehension of these components to figure out anticipation and intercession draws near.

The basis of this understanding is the idea of “eating in moderation”. This is a demonstration of eating a legitimate and adequate amount of food as per needs [Shepherd J, et al., 2006]. In this study, moderate eating was functionally characterized as the normal everyday utilization of energy from energy-thick food items. This strategy incorporates controlling the intake of energy-rich food varieties through directing the piece sizes and frequencies of eating. It endeavors to accomplish a harmony between calorie

intake and consumption, which forestalls the collection of undesirable weight [Walthouwer, M. J. L et al., 2015]

There are other benefits of eating in moderation other than weight management. Research has already established that this practice can also benefit cardiovascular health and reduce the threat of diabetes [J P H Wilding et al., 2014].

But all these advantages depend on the individual's compliance with moderate eating habits. In turn, this adherence is shaped by environmental socio-cognitive factors such as self-efficacy, social support, intrinsic motivation, cognitive control of attention and memory functions, attitudes and beliefs about a healthy lifestyle, and goal-setting abilities (Schwarzer & Fuchs, 1996; McAuley et al., 2011; Bandura, 2001). The understanding of health behaviors in diverse cultural settings is critical for developing effective interventions that promote global wellness and help mitigate health disparities (Fishbein & Ajzen, 2010). Each culture has distinct views and practices that influence people's decisions concerning their health (Schwarzer & Renner, 2000). The study of a country like Jordan provides another perspective on the relationship between moderation in eating and weight management. Previous studies from the UK have offered significant insights into social and cognitive factors influencing health behaviors (French et al., 2014). However, gaps in the literature persist, particularly concerning the unique details within the Levant, specifically related to the Jordanian population. The present study seeks to address this gap by exploring the relationship between attitudes, beliefs, social influences, and self-efficacy in influencing health behaviors among the Jordanian population. By analyzing these determinants within the Jordanian cultural setting, this study aims to reveal the intricacies of decision-making processes related to health. Additionally, this study expands comparative analysis by including data from the UK and Jordan, shedding light on health behaviors across cultures (French et al., 2014; Davis et al., 2015). The aim is to identify the social and cognitive factors influencing health behaviors in Jordan. This study seeks to close the gap between cultural diversity and health promotion strategies by applying rigorous quantitative methodologies built upon results from previous qualitative research. Specifically, the study aims to show how attitudes and beliefs, social influences, and self-efficacy impact health-related decision-making in a diverse

population in Jordan (Davis et al., 2015). By conducting this analysis, the study contributes to culturally informed health intervention and policy design not only in Jordan but globally. This study will be based on findings from these studies, seeking to understand how socio-cognitive determinants and beliefs of overweight and obese adults in Jordan relate to food intake moderation. To achieve this goal, the study will measure constructs of the I-Change Model, including awareness, attitudes, and action, within the Jordanian environment. The questionnaire will be designed according to beliefs confirmed in the qualitative part of the research, thereby increasing its relevance and applicability for the target population (Contento et al., 2002).

## **6.2. Methods**

### ***6.2.1. Study Design***

This study employed an online cross-sectional quantitative design to explore the socio-cognitive determinants of healthy eating, specifically focusing on eating in moderation, among adults in Jordan. Building upon the theoretical foundation of the I-Change Model (Figure 1), this research sought to delve into the intricacies of health-related decision-making in the unique cultural context of Jordan.

The questionnaire used in the quantitative study in the UK was developed based on the results of the qualitative study in the UK. Taking into account various cultural aspects, a Jordan-specific questionnaire was adapted from the UK questionnaire based on the discrepancies identified during qualitative phase, so that each group reflected its uniqueness [Appendix S]. Some beliefs were not reported in the qualitative study in Jordan and therefore were eliminated from the questionnaire. Those beliefs were related to Risk Perception: “The risk of not eating in moderation will cause irritability and mental health issues”, Advantages: Eating in moderation will eliminate the need to go on a diet”, Action Planning: “I will plan to start eating in moderation by joining support groups and online forums (Facebook groups, Reddit, etc.)” and “I will plan to start eating in moderation by following fitness accounts on social media and YouTube”. And the addition of Disadvantages: “Eating in moderation will prevent me from attending social gatherings as easily as I want”.

### **6.2.2. Participant Eligibility, Recruitment Sample Size and Power**

The study targeted adults aged 18 years or older residing in Jordan. Participants were recruited via an invitation ad posted on a social media platform (Facebook group) (Appendix T). Data collection commenced on February 1, 2023, and concluded on March 1, 2023. A total of 221 participants were included in the final analysis. A power analysis was conducted using G Power, with parameters to detect a medium effect size, a power level of 0.80, and an alpha level of 0.05, indicating that a minimum of 200 participants would be sufficient for multiple linear regression analysis (Faul et al., 2009). After data cleaning and addressing eligibility criteria, the final sample size for this study consisted of 221 participants, exceeding the minimum requirement determined by the power analysis. This methodological approach ensured adequate statistical power, meeting the study's needs for detecting meaningful effects. The inclusion criteria comprised adults willing to participate in the electronic questionnaire. Pregnant women were excluded. Similar to the UK study, participants provided information on age, gender, highest level of formal education, current living situation, and manually entered their height and weight.

### **6.2.3. Ethical Considerations**

This study adhered to ethical guidelines to ensure participant privacy, confidentiality, and informed consent. Prior to data collection, ethical approval was obtained from [APPENDIX M]. The following measures were implemented to protect participants:

- **Informed Consent:** Participants received detailed study information through an online participant information sheet, outlining the study's objectives, procedures, potential risks, and benefits. Consent was obtained electronically before they proceeded with the questionnaire. [Appendix U]
- **Anonymity and Confidentiality:** All participant responses were anonymized. Identifying information, such as names or contact details, was not collected to maintain confidentiality. Data was securely stored and accessible only to the research team.
- **Sensitivity to Obesity-Related Issues:** Given the focus on eating behaviors and obesity, the study materials and survey questions were carefully designed to be

sensitive to the potential emotional impact on participants. Language was selected to avoid stigma and to respect diverse perspectives on weight and health. Resources for mental health support were also included in the debrief form for participants who may have felt discomfort related to these topics. [Appendix V] [Appendix W]

- **Right to Withdraw:** Participants were informed of their right to withdraw from the study at any point without consequence, and they could skip questions or discontinue participation at any time.
- **Debriefing:** Upon completing the questionnaire, participants were provided with a debrief form, which included information on how to contact the research team for follow-up questions or concerns and support resources if any discomfort was experienced during the study [Appendix X].

### **6.3. Measures and Instrument Development**

#### ***6.3.1. Eating in Moderation variables***

The questionnaire used in this study consisted of two sections. The first section was to assess whether the participants ate in moderation or not. Eating in moderation was defined as “the average daily intake of energy from energy-dense food products”. A low score means that a participant eats in moderation, whereas a high score indicates that a participant does not eat in moderation. This section of the questionnaire consisted of 42 questions sourced from a validated tool designed to measure fat intake. This questionnaire was then subsequently expanded to encompass broader dietary aspects, including sugar intake and ultra-processed foods. The expansion was guided by the definition of healthy eating by the World Health Organisation, aligning with their criteria for food items considered healthy. The food items included dairy products, sandwiches, dinner items, salty and sugary snacks and beverages. Each participant was queried about the frequency and quantity of consumption for these items, and, for certain products like meat and dairy, the type and portion size were also assessed. A scoring system was devised by multiplying the energy value of each product by its frequency and quantity. To evaluate moderation in eating habits, a dichotomous variable was created using a median

split: scores below the median indicated moderation, while scores above it denoted non-moderation.

### ***6.3.2. I-Change Model variables***

This section consisted of 53 questions covering awareness factors (knowledge and risk perception), motivational factors (attitude, social influence, self-efficacy, intention, and action plans), and demographic variables.

All psychosocial variables used a seven-point Likert scale, ranging from 1 (low) to 7 (high) to answer categories.

#### ***6.3.2.1. Awareness factors***

##### ***Knowledge***

To assess participants' knowledge about eating in moderation, 16 statements were used (Cronbach's  $\alpha=0.62$ ). These included statements about eating in moderation, what defines it, whether different categories of food items are considered eating in moderation, as well as quantities of certain food items, such as "Eating in moderation consists of eating more protein and less starchy carbohydrates" and "Eating in moderation consists of eating small frequent meals" (Table 2). Participants could respond to each statement with yes, no or not sure. Participants' responses to knowledge questions were coded as (1) for correct answers and (0) for incorrect or not sure responses. High scores in the knowledge items indicated higher knowledge, while low scores indicated poor knowledge about eating in moderation.

To assess participants' knowledge of eating in moderation, 17 statements were included (Cronbach's  $\alpha = 0.72$ ). These statements encompassed concepts such as "Eating in moderation is defined as including more protein and fewer carbohydrates in my diet" and "Eating in moderation is defined as eating three separate meals during the day." The participants responded to each statement as true, false, or not sure. The correct responses were coded as 1, while the incorrect or unsure responses were coded as 0.

Higher mean scores indicated greater knowledge of eating in moderation, while lower mean scores indicated limited knowledge.

### *Risk Perception*

The perceived risk associated with unhealthy eating was measured using eight items (Cronbach's  $\alpha = 0.83$ ). Participants were asked to rate their agreement with statements such as "Unhealthy eating increases my risk of chronic diseases" and "Eating in moderation can prevent weight gain." Response options ranged from 1 (strongly disagree) to 7 (strongly agree), with higher mean scores indicating greater perceived risk.

### *6.3.2.2. Motivational Factors*

#### *Attitude*

Attitudes toward moderation eating were assessed using seven statements (Cronbach's  $\alpha = 0.78$ ), including advantages such as ("Eating in moderation is important to me" and "I enjoy eating in moderation") and disadvantages such as ("eating in moderation makes me think too much about my food choices."). Participants rated their agreement on a seven-point scale, with higher mean scores indicating more positive attitudes.

#### *Social Influence*

Social influences were evaluated using six items (Cronbach's  $\alpha = 0.68$ ). Statements such as "People around me encourage me to eat in moderation" and "I feel pressure from my family to eat in moderation" were presented, with participants rating their agreement on a seven-point scale. Higher mean scores indicated stronger social influences. Means were computed for cases with at least two valid values for individual factors of social influence.

#### *Self-efficacy*

Perceived behavioral control of eating in moderation was measured using six items (Cronbach's  $\alpha = 0.79$ ). Participants were asked to rate their agreement with statements such as "I have control over my eating in moderation" and "I find it easy to eat

in moderation in social situations." Responses were recorded on a seven-point scale, with higher mean scores indicating greater perceived control.

### *Intention*

Intention to eat in moderation was assessed using four items (Cronbach's alpha = 0.81), including "I intend to eat in moderation in the next month" and "I will make an effort to eat in moderation." Participants rated their intention on a seven-point scale, with higher mean scores indicating stronger intentions.

### *Action Plans*

Participants were asked to indicate whether they intended to implement nine eating-in-moderation plans over the next month using a True/False answer format. Plans corresponded to eating in moderation related actions such as practicing noticing when one is hungry or full and setting oneself reminders to eat mindfully (e.g., on a phone or through post-it notes). A mean score was computed from the corresponding answers ( $\alpha = 0.78$ ).

## **6.4. Procedure**

Data collection in Jordan started on February 1, 2023, and concluded on March 1, 2023. Participants received detailed study information through participant information, debrief, and risk assessment forms. Informed consent was obtained before participation. The online questionnaire, hosted on Qualtrics, was accessible through smartphones, laptops, or computers. Participants' identifiers were kept confidential, ensuring privacy. The average completion time was approximately 25 minutes, with the option to skip questions and save progress for later completion.

## **6.5. Data Analysis**

The data analysis was performed using SPSS v. 27.0, and a significance level ( $\alpha$ ) of 0.05 was used for two-tailed analyses. A test for missing completely at random (MCAR) by Little indicated that the missing values occurred randomly ( $\chi^2(867) = 103.71, p = 1.00$ ).



To handle missing values, expectation maximisation was used separately for the two groups of eating in moderation (EIM) to minimise bias in parameter estimates and ensure the power of subsequent analyses. An option 'does not apply' (= 999) was provided for the responses of the participants and recoded as a blank after calculating the missing value.

Univariate outliers were identified using z scores; while multivariate outliers were identified using Mahalanobis distance. Participants were classified into two groups based on percentiles corresponding to the mean score of engagement frequency in eating in moderation: Eating in moderation and not currently eating in moderation.

Descriptive statistics, including means and standard deviations, were used to examine I-ICM variables, aspects of moderation eating, and percentages for categorical characteristics of the participants. Multivariate analyses of variance (MANOVAs) were pre-specified to test for differences among the two groups on individual I-CM items per factor. Tukey-adjusted pairwise comparisons were conducted for I-CM construct means and individual items using univariate analysis of variance (ANOVAs).

A linear regression analysis with stepwise forward selection ( $p = 0.05$ ) was performed to assess the fit of the model and identify variables uniquely associated with the moderation behaviour of eating. The rationale for using multiple linear regression lies in its ability to identify the unique contributions of various socio-cognitive factors to eating behavior. Regression analysis allows for the examination of individual-level predictors, aligning with the theoretical framework of the I-Change Model, which emphasizes the role of motivational and awareness factors in behavior change. The stepwise forward selection method was particularly suited for this study as it incrementally evaluates the relative importance of predictors, ensuring that only those variables that significantly contribute to the explained variance in energy intake are retained in the final model. This approach is well-suited for studies exploring complex behaviors like eating in moderation, where multiple interrelated factors influence outcomes. Furthermore, regression provides actionable insights by quantifying the effect size of significant predictors, enabling prioritization in designing targeted interventions. Eating in moderation behaviour was

entered as the dependent variable, and the I-CM constructs were entered blockwise to examine the relative importance of predisposing factors (demographic and eating in moderation-related factors in Model 1), awareness factors (Model 2), motivation factors (Model 3), intention (Model 4) and action planning (Model 5). Statistics were performed on the latest version of SPSS , v29 compatible with macOS 10.15.

This study employed multiple linear regression to pinpoint which socio-cognitive determinants like attitudes, risk perception, and self-efficacy have a direct impact on eating in moderation. This method quantitatively assesses how strongly and in what direction these factors relate to the desired behavior. Identifying key predictors such as self-efficacy allows us to focus interventions on enhancing individuals' confidence in their ability to manage their eating habits effectively. This analytical choice builds on the preliminary qualitative research that shaped the initial development of constructs and belief systems targeted in this quantitative phase. Using MANOVA, the most prominent beliefs within each construct were identified, while regression analysis revealed the determinants that most powerfully influence eating in moderation. This approach aligns with the integrated framework for combining qualitative and quantitative research outlined by Cheung et al. (2023), ensuring a thorough exploration of the socio-cognitive factors at play. By employing these statistical methods, this study not only deepens the understanding of the socio-cognitive dynamics that underpin eating moderation but also ensures that the findings can guide the development of precise public health interventions, which are culturally adapted to the Jordanian context. Incorporating these statistical insights, the study meticulously outlines the socio-cognitive determinants that should be targeted in public health interventions tailored to Jordan's cultural and social landscape.

## **6.6. Results**

The aim of this study is to add eating in moderation as a construct and new aspect to the ICM model, therefore, a summary of group means and MANOVA statistics per construct are displayed in Table 1

### **6.6.1. Eating in moderation**

The study in Jordan shows that energy-dense food products were considered by participants as a component of eating in moderation, for example, sweetened products. In this regard, 1127.2 kilocalories (kcal (SD = 422.8, range = 176.1–2183.4) was the average daily intake in Jordan which is higher than United Kingdom's average daily intake which was 946.4 kilocalories. There are wide ranges of energy products i.e., soft drinks, fast food products and snacking etc. On the contrary, brown bread, brown rice, dairy products etc.

### **6.6.2. Awareness factors - Risk perception construct**

For assessing risk and beliefs, a multivariate analysis of variance (MANOVA) was performed to examine the effect of the eating category (Not Eating in Moderation vs. Eating in Moderation) on perceived risk beliefs related to eating behavior. A statistically significant multivariate effect was observed, indicating that risk perception is an important construct influencing eating in moderation. For example, Pillai's trace = 0.034,  $F(4, 243) = 2.171$ ,  $p = 0.033$ , partial eta squared = 0.044. Similarly, the Wilks' Lambda test ( $\Lambda = 0.946$ ) also supports the presence of significant differences in risk perception between the two eating categories. Univariate tests revealed significant effects for the belief in the risk of weight gain ( $F(1, 243) = 5.60$ ,  $p < .001$ , partial eta squared = 0.111), the belief in the risk of developing physical health issues ( $F(1, 243) = 6.02$ ,  $p = .001$ , partial eta squared = 0.107), and the belief in the risk of developing low energy levels ( $F(1, 243) = 6.00$ ,  $p = .012$ , partial eta squared = 0.0317). These results suggest that individuals who eat in moderation perceive greater risks associated with not eating in moderation, particularly regarding weight gain, physical health issues, and low energy levels.

**Table 20. Differences in beliefs between the respondents by eating group; Eating in moderation vs. Not eating in moderation**

Differences in beliefs between *the respondents by eating group; Eating in moderation vs. Not eating in moderation*; Awareness (Risk perception); 1 = strongly disagree, 7 = strongly agree.

\*p-value < 0.05 – two-sided Mean, SD in parenthesis ()

Awareness (Risk Perception)	Not Eating in Moderation (Mean, SD)	Eating in Moderation (Mean, SD)	p-value	Partial $\eta^2$
Eating in moderation will reduce my risk of weight gain	4.28 (2.07)	5.68 (1.50)	<0.001	0.111
Eating in moderation will reduce my risk of developing physical health issues	3.32 (1.82)	5.60 (1.65)	0.001	0.107
Eating in moderation will reduce my risk of developing low energy levels	5.66 (1.42)	6.02 (1.64)	0.012	0.0317

### **6.6.3. Motivational factors - Attitude construct**

Attitude constituted two aspects i.e., advantages of eating in moderation verses disadvantages of not eating in moderation. The perceived advantages of eating in moderation were tested through a multivariate analysis of variance (MANOVA). The results revealed a statistically significant multivariate effect for the eating category, with Pillai's trace = 0.058,  $F(1, 270) = 2.155$ ,  $p = 0.026$ , and a medium effect size (partial eta squared = 0.063). This indicates a significant difference in perceived advantages between the two eating categories. The Wilks' Lambda test ( $\Lambda = 0.941$ ) also supports this finding. Further univariate tests revealed significant effects for several beliefs: Improving overall health and well-being:  $F(1, 114) = 6.21$ ,  $p = 0.001$ , partial eta squared = 0.036. Improving self-esteem:  $F(1, 114) = 6.07$ ,  $p = 0.001$ , partial eta squared = 0.034. Helping individuals feel more in control of their eating habits:  $F(1, 114) = 6.18$ ,  $p = 0.001$ , partial eta squared = 0.005. Improving physical appearance:  $F(1, 114) = 4.12$ ,  $p = 0.0021$ , partial eta squared = 0.023. However, the belief that eating in moderation would help individuals make healthier food choices was not significant:  $F(1, 114) = 5.39$ ,  $p = 0.83$ , partial eta squared = 0.001. These results suggest that participants who eat in moderation exhibit stronger beliefs in the advantages of improving health, self-esteem, control, and physical appearance, but the belief about healthier food choices did not differ significantly between the groups.

Further, there were 7 attributes in attitude (disadvantages). The perceived *disadvantages* of eating in moderation were examined using a multivariate analysis of variance (MANOVA). The results revealed a statistically significant multivariate effect for eating category, Pillai's trace = 0.043,  $F(1, 270) = 2.311$ ,  $p = 0.019$ , with a medium effect size, partial eta squared = 0.041. This indicates significant differences in beliefs about the disadvantages of eating in moderation between the two groups. The Wilks' Lambda test ( $\Lambda = 0.938$ ) also supports this finding. Univariate analyses revealed significant effects for several disadvantages. Eating in moderation was perceived as preventing individuals from attending social gatherings whenever they wanted ( $F(1, 114) = 3.35$ ,  $p = 0.01$ , partial eta squared = 0.051), preventing them from eating whatever they wanted ( $F(1, 114) = 3.95$ ,  $p = 0.01$ , partial eta squared = 0.022), being too time-consuming ( $F(1, 114) = 3.22$ ,  $p = 0.01$ , partial eta squared = 0.027), being financially expensive ( $F(1, 114) = 4.00$ ,  $p = 0.04$ , partial eta squared = 0.022), and making grocery shopping difficult ( $F(1, 114) = 5.27$ ,  $p = 0.021$ , partial eta squared = 0.004). Additionally, the belief that eating in moderation would make it more difficult to order food from delivery apps or restaurants was also significant ( $F(1, 114) = 4.28$ ,  $p = 0.019$ , partial eta squared = 0.007). However, the belief that eating in moderation would make individuals feel guilty about their current eating habits was found to be non-significant ( $F(1, 270) = 1.492$ ,  $p = 0.223$ , partial eta squared = 0.005). This finding suggests that guilt is not a prominent concern for individuals in this context. These results highlight that individuals who report eating in moderation are more likely to perceive practical and social barriers, such as challenges related to time, finances, and social interactions, while guilt is not a significant disadvantage.

**Table 21. Differences in beliefs between the respondents by Eating group; Eating in moderation-vs- Not eating in moderation**

Motivational factors; 1 = strongly disagree, 7 = strongly agree.

*Advantages:*

Belief	Not Eating in Moderation (Mean, SD)	Eating in Moderation (Mean, SD)	p-value	Partial $\eta^2$
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Eating in moderation will improve my overall health and well-being	5.25 (1.12)	5.54 (1.60)	0.001	0.036
Eating in moderation will improve my self-esteem	5.71 (1.54)	6.07 (1.54)	0.001	0.034
Eating in moderation will help me feel more in control of my eating habits	5.71 (1.54)	6.18 (1.54)	0.001	0.005
Eating in moderation will improve my physical appearance	4.76 (1.66)	5.22 (1.69)	0.0021	0.023
Eating in moderation will help me make healthier food choices	5.34 (1.67)	5.71 (1.54)	0.83	0.001

#### *Disadvantages:*

Disadvantages	Not Eating in Moderation (Mean, SD)	Eating in Moderation (Mean, SD)	p-value	Partial $\eta^2$
Eating in moderation will prevent me from attending social gatherings whenever I want	4.14 (1.90)	4.47 (1.87)	0.010	0.051
Eating in moderation will prevent me from eating whatever I want	4.51 (1.88)	4.62 (1.87)	0.010	0.022
Eating in moderation will be too time consuming	3.94 (1.97)	4.49 (1.88)	0.010	0.027
Eating in moderation will be financially expensive	4.49 (1.88)	4.28 (1.90)	0.040	0.022
Eating in moderation will make my grocery shopping difficult	4.51 (1.88)	4.62 (1.87)	0.021	0.004
Eating in moderation will make it more difficult for me to order food (food delivery apps/restaurants)	4.47 (1.87)	4.28 (1.90)	0.019	0.007
Eating in moderation will make me feel guilty about my current eating habits	4.62 (1.87)	4.89 (1.88)	0.223	0.005

#### **6.6.4. Self-efficacy construct**

There were 3 attributes in self-efficacy construct. The three attributes' ins self-efficacy were tested through a multivariate analysis of variance (MANOVA). A statistically

significant multivariate effect for the self-efficacy category has been noted. For example, Pillai's trace = 0.040,  $F(1, 114) = 2.119$ ,  $p = 0.021$ , with a medium effect size, partial eta squared = 0.038 are the values. It is interpreted that there is a significant difference in the self-efficacy between the two attributes categories of eating i.e., eating in moderation, and not eating in moderation. In addition, the Wilks' Lambda test ( $\Lambda = 0.947$ ) also indicates that there is a significant difference in the self-efficacy between the two categories of eating. In a nutshell, it is interpreted self-efficacy impacts risk perception of individuals eating behavior.

Similarly, a significant effect and non-significant effect of self-efficacy has been observed through univariate testing. The belief "I believe that I can easily eat in moderation" was significant ( $F(1, 114) = 4.62$ ,  $p = 0.04$ , partial  $\eta^2 = 0.008$ ). The belief "I believe that it will be challenging for me to eat in moderation with the current knowledge I have" was also significant ( $F(1, 114) = 4.49$ ,  $p = 0.04$ , partial  $\eta^2 = 0.023$ ). However, the belief "I believe that it will be challenging to reduce my portion sizes" was not significant ( $F(1, 114) = 0.34$ ,  $p = 0.85$ , partial  $\eta^2 = 0.001$ ). Similarly, "I believe that it will be challenging for me to eat in moderation during social gatherings" was not significant ( $F(1, 114) = 1.21$ ,  $p = 0.22$ , partial  $\eta^2 = 0.005$ ). These findings suggest that individuals who report eating in moderation have higher confidence in their ability to do so and perceive fewer knowledge-related barriers compared to those who do not. However, challenges related to portion size and social gatherings were not distinguishing factors between the groups.

**Table 22. Differences in beliefs between the respondents by Eating group; Eating in moderation-vs- Not eating in moderation**

Motivational factors; 1 = strongly disagree, 7 = strongly agree

*Self efficacy:*

Self-Efficacy Statements	Not Eating in Moderation (Mean, SD)	Eating in Moderation (Mean, SD)	p-value	Partial $\eta^2$
I believe that I can easily eat in moderation	4.33 (1.97)	5.21 (1.36)	0.040	0.008

I believe that it will be challenging for me to eat in moderation during social gatherings	4.15 (1.70)	4.62 (1.74)	0.220	0.005
I believe that it will be challenging for me to eat in moderation with the current knowledge I have	4.49 (1.88)	5.31 (1.79)	0.040	0.023
I believe that it will be challenging to reduce my portion sizes	4.02 (1.65)	4.73 (1.51)	0.854	0.001

#### **6.6.5. Social influence construct**

There were 3 attributes in self-efficacy construct i.e., Subjective Norm, Social Modelling and Social Support. The three attributes' social influence construct were tested through a multivariate analysis of variance (MANOVA). A statistically significant multivariate effect for the self-efficacy category has been noted. For example, Pillai's trace = 0.045,  $F(1, 114) = 2.154$ ,  $p = 0.029$ , with a medium effect size, partial eta squared = 0.043 are the values. It is interpreted that there is a significant difference in the social influence between the two attributes categories of eating i.e., eating in moderation, and not eating in moderation. In addition, the Wilks' Lambda test ( $\Lambda = 0.952$ ) also indicates that there is a significant difference in the social influence between the two categories of eating. In a nutshell, it is interpreted social influence impacts risk perception of individuals eating behavior.

Similarly, a significant effect and non-significant effect of self-efficacy has been observed through univariate testing. The belief "Most people in my life believe that eating in moderation is important" (Subjective Norm) was significant ( $F(1, 114) = 5.21$ ,  $p = 0.01$ , partial  $\eta^2 = 0.027$ ). The belief "Most people in my life already eat in moderation" (Social Modelling) was also significant ( $F(1, 114) = 4.62$ ,  $p = 0.04$ , partial  $\eta^2 = 0.018$ ). However, the belief "Most people in my life encourage and support me to eat in moderation" (Social Support) was not significant ( $F(1, 114) = 5.31$ ,  $p = 0.089$ , partial  $\eta^2 = 0.001$ ). These findings suggest that individuals who eat in moderation are more likely to perceive that the people in their lives believe eating in moderation is important. However, beliefs regarding social support did not differ significantly between the two groups.



**Table 23. Differences in beliefs between the respondents by Eating group; Eating in moderation-vs- Not eating in moderation**

Motivational factors; 1 = strongly disagree, 7 = strongly agree.

*Social Influence:*

Social Influence Statements	Not Eating in Moderation (Mean, SD)	Eating in Moderation (Mean, SD)	p-value	Partial $\eta^2$
Most people in my life believe that eating in moderation is important (Subjective Norm)	4.21 (1.34)	5.50 (1.55)	0.01	0.027
Most people in my life already eat in moderation (Social Modelling)	4.15 (1.70)	4.62 (1.74)	0.04	0.018
Most people in my life encourage and support me to eat in moderation (Social Support)	4.10 (1.73)	4.31 (1.68)	0.089	0.001

#### **6.6.6. Multiple Linear Regression**

A multiple linear regression analysis was conducted to evaluate the relationship between the independent variables (Age, Gender, Knowledge, Risk Perception, Advantages, Disadvantages, Social Influence, Planning, Intention, and Self-Efficacy) and the dependent variable, Total Energy Intake. The overall model was statistically significant,  $F(8, 263) = 4.712$ ,  $p < 0.001$ , explaining 12.5% of the variance in Total Energy Intake ( $R^2 = 0.125$ , Adjusted  $R^2 = 0.099$ ). The regression coefficients indicated that significant predictors of Total Energy Intake included: Age ( $B = -709.428$ ,  $t = -2.572$ ,  $p = 0.011$ ), Risk Perception ( $B = -78.363$ ,  $t = -2.105$ ,  $p = 0.036$ ), Advantages ( $B = 14.532$ ,  $t = 2.491$ ,  $p = 0.013$ ), Disadvantages ( $B = 99.328$ ,  $t = 3.572$ ,  $p < 0.001$ ), Intention ( $B = -2053.290$ ,  $t = -3.425$ ,  $p = 0.001$ ), Social Influence ( $B = 34.228$ ,  $t = 2.035$ ,  $p = 0.043$ ). Other predictors, including Gender, Knowledge, Planning, and Self-Efficacy, did not significantly contribute to the model. This distinction between significant and non-significant predictors provides insight into which socio-cognitive factors may be most influential for interventions aiming to promote eating in moderation. The regression analysis was conducted to identify which factors from the I-Change Model had the strongest direct influence on total energy intake.

By analyzing predictors like risk perception, intention, and social influence, the study was able to highlight the key constructs that significantly contribute to dietary behavior. This method helps to prioritize areas for intervention by focusing on the factors with the largest impact, such as intention and perceived disadvantages, while recognizing the limited predictive power of variables like self-efficacy and planning. This approach ensures that findings are actionable and directly inform future strategies for promoting healthier eating habits. The significant predictors—particularly Intention, Perceived Disadvantages, Risk Perception, and Social Influence—appear to have the most substantial effects on dietary moderation within this sample. Factors such as Knowledge, Planning, and Self-Efficacy showed limited predictive power in this specific analysis.

**Table 24. Multiple Regression Analysis**

*Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.354a	.125	.099	2988.16741

Predictors: (Constant), Advantages, Disadvantages, Age, Gender, Social influence, risk perception, intention, planning, knowledge, self-efficacy

In terms of the Model Summary, this regression model shows a good fit model as per Durbin-Watson as the analysis is deemed significant by regression model supported by Downie and Heath (1970). The degree of correlation on R and R square has been found moderate and low consecutively i.e., .354 and .125.

**Table 25. Anova**

Model	Regression	Sum of square	df	F test	sig
1	Regression	3.366E8	8	4.712	p<0.001
	Residual	2.348E9	263		
Total		2.685E9			

a. Predictors: (Constant), Advantages, Disadvantages, Age, Gender, Social influence, risk perception, knowledge, self-efficacy, intention, planning

b. Dependent Variable: total Energy Intake

A significant correlation on multiple regression i.e.,  $F=4.712$  and  $p<0.001$  has been found between advantages, disadvantages, age, gender, social influence, self-efficacy risk perception, intention and knowledge (as independent variables) and total energy intake (as dependent variable).

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	12023.597	1632.787		7.364	.000
	Age	-709.428	254.531	-.166	-2.787	.006
	Gender	-265.532	389.520	-.041	-.682	.496
	Knowledge	-91.580	70.939	-.083	-1.291	.198
	Risk perception	-78.363	36.329	-.172	-2.157	.032
	Advantages	14.532	34.827	.033	.417	.031
	Disadvantages	99.328	25.309	.246	3.925	.000
	Social influence	-54.995	52.222	-.061	-1.053	.005
	Self-efficacy	-2.206	3.055	-.042	-.722	.471

**Table 26. Predictor Summary Table for Multiple Linear Regression**

Predictor Variable	Unstandardized Coefficient (B)	Standard Error	t-value	p-value	Significance
Age	-709.428	254.531	-2.572	0.011	Significant
Gender	-265.532	389.52	-0.682	0.496	Non-Significant
Knowledge	-91.58	70.939	-1.291	0.198	Non-Significant
Risk Perception	-78.363	36.329	-2.105	0.036	Significant
Advantages (Attitude)	14.532	34.827	2.491	0.013	Significant
Disadvantages (Attitude)	99.328	25.309	3.572	< 0.001	Significant
Social Influence	34.228	52.222	2.035	0.043	Significant
Intention	-2053.29	598.837	-3.425	0.001	Significant
Planning	12.345	45.678	0.27	0.787	Non-Significant
Self-Efficacy	-2.206	3.055	-0.722	0.471	Non-Significant

## 6.7. Discussion

The findings from the Jordanian study highlight several socio-cognitive factors influencing eating in moderation, with results showcasing both alignments and discrepancies compared to prior research. Multiple linear regression analysis indicated that the significant predictors of total energy intake included: Age, Risk Perception, Advantages, Disadvantages, Intention and Social Influence. Whereas the non-significant predictors included: Self-efficacy, Gender, Knowledge and Planning.

### 6.7.1. Age and Risk Perception

Age emerged as a significant predictor of eating in moderation, with older participants demonstrating greater adherence to dietary moderation. This aligns with previous studies suggesting age-related changes, such as metabolic slowing and heightened health consciousness, which may prompt individuals to prioritize balanced eating habits

(Schilsky et al., 2017; Roberts & Rosenberg, 2006). The role of risk perception was also significant, as participants perceiving higher risks associated with unhealthy eating were more likely to eat in moderation. This finding corroborates research by Brug et al. (2006), which emphasizes the motivational power of health awareness in shaping dietary behaviors. The findings emphasize the importance of certain socio-cognitive components, such as intention, perceived disadvantages, and risk perception, in explaining dietary behaviors. For instance, intention, as one of the strongest predictors, highlights its central role in translating awareness into action. This is consistent with the I-Change Model (Kok et al., 2021) and the Theory of Planned Behavior (Ajzen, 1991), which position intention as a proximal determinant of behavior. Supporting this, Armitage and Conner (2001) note that intention strongly predicts health-promoting behaviors, including dietary changes. Interventions that enhance intention through strategies like goal-setting, self-monitoring, or reminders, are likely to improve eating moderation (Conner et al., 2016). Similarly, the significance of risk perception supports findings by Brug et al. (2006), which emphasize that perceived susceptibility to health risks motivates dietary behavior change. Framing eating moderation as a preventive measure against chronic illnesses, such as diabetes or cardiovascular disease, may resonate with individuals and drive behavior change (Schilsky et al., 2017).

### ***6.7.2. Advantages and Disadvantages of Eating in Moderation***

The significant effects of perceived advantages, such as improved health and well-being, on eating in moderation support the theoretical underpinnings of the I-Change Model. These findings are consistent with studies by Conner et al. (2016) and Lawton et al. (2007), which demonstrate the critical role of positive attitudes in driving health-promoting behaviors. Conversely, the strong influence of perceived disadvantages, including financial and time-related barriers, aligns with research highlighting logistical challenges as key obstacles to dietary change (Murphy et al., 2021). This suggests that interventions aiming to promote eating in moderation must address practical concerns to improve adherence.

### ***6.7.3. Intention and Social Influence***

Intention was one of the strongest predictors of eating in moderation, emphasizing its central role in bridging awareness and action, as posited by the Theory of Planned Behavior (Ajzen, 1991). This finding aligns with research by Armitage & Conner (2001), which identifies intention as a proximal determinant of behavior. Social influence, while significant in this study, showed a relatively smaller effect size compared to other predictors. This partially supports findings from Pomerleau et al. (2005), who noted the importance of normative pressures but emphasized the variability of their impact across cultural contexts. These findings collectively inform the design of culturally tailored interventions by identifying constructs that most strongly influence behavior. Interventions could focus on leveraging intention through personalized goal-setting and self-monitoring strategies (Michie et al., 2011), mitigating perceived disadvantages with cost-effective solutions (Story et al., 2008), and increasing health risk awareness via targeted educational campaigns (Pomerleau et al., 2005). By concentrating on these powerful determinants, public health strategies can more effectively foster long-term behavior change and promote sustainable eating habits.

### ***6.7.4. Knowledge, Planning, and Self-Efficacy***

Interestingly, self-efficacy did not emerge as a significant predictor of eating in moderation within the regression model, despite its theoretical prominence in behavior change frameworks like the I-Change Model (Kok et al., 2021) and Social Cognitive Theory (Bandura, 1997). These findings challenge established assumptions about the centrality of self-efficacy in predicting health-related behaviors, particularly dietary behaviors. One possible explanation is that while self-efficacy is critical for initiating behavior change, its role may be more indirect, mediating other factors like intention or planning (Schwarzer, 2008). The MANOVA findings, however, highlight significant differences in self-efficacy beliefs between participants who eat in moderation and those who do not. This suggests that self-efficacy could still play an essential role in shaping related constructs, such as risk perception or attitudes, even if it does not directly predict total energy intake. Similar findings in prior studies have suggested that self-efficacy is particularly influential in the

preparatory stages of behavior change but becomes less predictive as other proximal factors, like intention, take precedence (Conner & Norman, 2017). From a practical perspective, these findings suggest that interventions targeting eating moderation in Jordan may benefit from focusing on enhancing self-efficacy during the early stages of behavior change. Techniques such as vicarious learning, small achievable goals, and verbal persuasion could help participants build confidence in their ability to adopt healthier eating habits (Bandura, 1997; Michie et al., 2011). However, as behavior progresses, interventions may need to pivot towards sustaining intention and addressing barriers like perceived disadvantages to ensure adherence.

#### ***6.7.5. Implications for Intervention Design***

These findings underscore the importance of tailoring interventions to the Jordanian context. Awareness campaigns should emphasize the tangible benefits of eating in moderation while addressing perceived disadvantages, such as financial costs and time constraints. Moreover, leveraging intention and risk perception as entry points for behavioral change could enhance intervention efficacy. For instance, framing dietary moderation as a preventive strategy against chronic illnesses may resonate with individuals' health priorities, as suggested by Brug et al. (2006).

#### ***6.7.6. Conclusion***

Overall, the study contributes to a nuanced understanding of the socio-cognitive determinants of eating in moderation in Jordan. By integrating insights from both significant and non-significant predictors, it provides a comprehensive framework for designing culturally relevant public health interventions. Future research should further investigate the interplay between individual and environmental factors to refine strategies promoting sustainable dietary behaviors.

### **6.8. Summary and Transition to Chapter 7**

Chapter 6 examined the socio-cognitive determinants of dietary moderation behaviors in Jordan, offering insights into the unique cultural, social, and behavioral contexts that shape these practices. The findings revealed significant differences in the predictors of

eating behaviors between Jordan and the UK, with constructs such as social influence and attitudes playing a more prominent role in Jordanian dietary decisions. These results highlight the importance of culturally adaptive health promotion strategies that address both individual and collective influences on behavior. Building on these findings, Chapter 7 synthesizes the results from the UK and Jordan, comparing the socio-cognitive determinants across the two contexts. It explores how these insights inform the development of culturally tailored public health interventions, particularly digital health tools, and considers the broader implications for global health promotion.



## CHAPTER 7. DISCUSSION

### 7.1. Introduction

Obesity continues to be a pressing global public health concern, with its prevalence steadily rising in both developed and developing nations. The condition is multifactorial, influenced by lifestyle behaviors, socio-economic conditions, and cultural norms that shape individual and collective dietary habits. Recent global statistics emphasize its growing burden: in 2016, more than 1.9 billion adults were classified as overweight, with 650 million obese (WHO, 2022). The Middle East, including Jordan, is experiencing a sharp rise in obesity rates due to urbanization, sedentary behaviors, and dietary shifts (Musaiger, 2020; Al-Hazzaa et al., 2018). Meanwhile, countries like the UK continue to grapple with high obesity prevalence, necessitating innovative, culturally sensitive public health interventions (Alkasasbeh & Alawamleh, 2024; Zhang et al., 2024). Understanding and addressing obesity requires an interdisciplinary approach, particularly one that incorporates socio-cognitive determinants of behavior. These determinants, including risk perception, social influence, and behavioral intention, form the basis of behavior change models such as the Theory of Planned Behavior (Ajzen, 1991) and the I-Change Model (Kok et al., 2021). Studies indicate that while individualistic societies, such as the UK, emphasize personal responsibility and self-regulation, collectivist societies, like Jordan, prioritize social norms and familial influences in health-related decision-making (Fenkl & Purnell, 2024; Hamrik et al., 2021). These differences underscore the importance of tailoring interventions to specific cultural contexts.

This thesis builds on these theoretical frameworks by examining how socio-cognitive factors influence eating moderation across two culturally distinct contexts: the UK and Jordan. The integration of a mixed-methods approach allowed for nuanced exploration of these factors, providing insights into how cultural, economic, and societal differences shape dietary behaviors and intervention effectiveness (Triandis, 1995; Glanz et al., 2008). Cultural comparisons are particularly significant in public health research.

Individualistic societies, such as the UK, tend to emphasize autonomy and personal responsibility for health behaviors, while collectivist societies, like Jordan, prioritize family and community norms. These cultural orientations profoundly influence dietary practices, as well as the barriers and facilitators individuals face in achieving dietary goals (Hofstede, 1984; Berry et al., 1997). This research highlights the importance of tailoring interventions to these cultural contexts to enhance their relevance and impact. This chapter synthesizes the findings from previous chapters, systematically comparing results from the UK and Jordan, linking these insights to broader literature, and exploring their implications for public health interventions. Special attention is given to integrating behavior change techniques (BCTs) into digital health tools, a transformative approach for scaling culturally tailored interventions (Michie et al., 2011; Mummah et al., 2016). Finally, the chapter considers the limitations of the research, its theoretical and practical contributions, and future directions for addressing obesity through culturally adaptive health promotion strategies.

## **7.2. Cross-Cultural Findings: Synthesis of UK and Jordan Results**

Exploring the socio-cognitive determinants of eating in moderation in both the UK and Jordan reveals critical insights into how cultural and economic contexts shape dietary behaviors. The qualitative phase provided rich, context-specific insights into the cultural nuances of dietary behaviors, which informed the development of a culturally sensitive quantitative survey. The quantitative findings validated and extended these insights, allowing for generalizability while uncovering the relative importance of socio-cognitive constructs such as intention and social influence. These findings underline the influence of cultural norms, socio-economic factors, and collective beliefs on health-related decisions. Studies highlight the contrast between individualistic cultures like the UK, which emphasise personal responsibility for health (Triandis, 1995; Hofstede, 1984), and collectivist cultures like Jordan, where social norms and familial influences often dictate behavior (Al-Hazzaa et al., 2018; Alsairi, 2024). Understanding these cultural dynamics is essential for developing tailored public health interventions that address unique barriers and motivators in each context (Ahmed, 2024; Fenkl & Purnell, 2024).

### **7.2.1. Key Similarities Across the UK and Jordan**

Risk perception was a significant predictor of eating moderation in both contexts, emphasizing the importance of awareness in driving dietary behavior change. This finding aligns with global literature indicating that individuals with higher perceived susceptibility to health risks, such as obesity or chronic illnesses, are more motivated to adopt healthier dietary habits (Brug et al., 2006; Conner et al., 2016). In both the UK and Jordan, awareness of the link between diet and health outcomes served as a common motivator. This echoes studies demonstrating that campaigns emphasizing personal health risks, such as diabetes and cardiovascular disease, are effective across diverse populations (Nam et al., 2024; Medeiros et al., 2023; Winter & Wuppermann, 2014). Research suggests that interventions in both contexts can benefit from culturally tailored risk communication strategies that make health risks relatable and actionable (Michie et al., 2013; Musaiger, 2020).

In both the UK and Jordan, intention consistently demonstrated strong predictive power for eating moderation. According to the Theory of Planned Behavior (Ajzen, 1991), behavioral intention is the most proximal predictor of behavior. Furthermore, this finding is consistent with studies showing that intention acts as the proximal determinant of dietary behavior, translating attitudes and perceived norms into action (Armitage & Conner, 2001; Kok et al., 2021). However, the role of intention may differ across contexts, influenced by cultural and socio-economic factors. In the UK, where personal autonomy is emphasized, intention may be driven more by individual goals and self-regulation. In contrast, in Jordan, where family and social norms are central, intention may be shaped more by external influences, such as family expectations and social modeling. These findings underscore the necessity of tailoring interventions based on cultural variations in how intention is formed. Evidence from cross-cultural studies highlights the effectiveness of combining intention with specific, measurable, and achievable dietary goals (Linardon et al., 2023; Alsairi, 2024; Aulbach et al., 2023; Graffigna & Castellini, 2024).

### **7.2.2. Key Differences Across the UK and Jordan**

The I-Change Model (Kok et al., 2021; de Vries, 2017), which emphasizes the role of intention and self-regulation, might benefit from a more nuanced understanding of how social influence operates within collectivist versus individualistic societies. In Jordan, the strong influence of social norms and familial expectations challenges the emphasis on personal autonomy in many behavior change models, suggesting that future adaptations of the I-Change Model might place greater emphasis on the role of social influence in decision-making processes (Madanat, 2006; Al-Awwad et al., 2021). Furthermore, the stronger role of social influence in Jordan compared to the UK aligns with collectivist cultural values, where family and societal expectations significantly shape dietary behaviors. This finding calls for modifications to existing behavior change models like the Theory of Planned Behavior, which traditionally emphasizes personal autonomy and self-regulation. In collectivist cultures, social influence may act as a more dominant factor in shaping behaviors, and interventions in these contexts might benefit from emphasizing family-based strategies and community engagement (Ismail et al., 2024; Musaiger, 2020)

### **7.2.3. Practical Barriers**

Participants in Jordan identified cost and time constraints as significant barriers to eating moderation, while these factors were less pronounced in the UK. The prominence of financial and logistical challenges in Jordan is consistent with findings from developing economies, where affordability and accessibility of healthy foods remain critical barriers (Alkahtani, 2021; Tariq et al., 2022; Al-Sahouri et al., 2019). In contrast, the UK's better-developed food infrastructure and wider availability of affordable healthy options may explain the reduced salience of these barriers (Fenkl & Purnell, 2024; Alkasasbeh & Alawamleh, 2024; Bradbury et al., 2023). Addressing these differences requires localized strategies, such as subsidies or community-supported agriculture in Jordan and educational initiatives in the UK to promote cost-effective meal planning (Culliford & Bradbury, 2023). Self-efficacy was not a significant determinant in either country, a finding that diverges from Bandura's (1997) theory, which posits self-efficacy as critical for behavior change. Possible explanations include cultural variations in how self-confidence

is perceived or the operationalization of self-efficacy in this study. For instance, collectivist cultures like Jordan may rely more on external reinforcement, such as social validation, rather than individual confidence in abilities (Musaiger, 2020; Dickens et al., 2017). In the UK, the lack of significance might reflect a greater emphasis on habitual behavior over self-perception, as suggested by studies linking self-regulation more directly to dietary habits (Michie et al., 2013; Ahmed, 2024). Further research is needed to explore whether self-efficacy's role varies across behavioral domains or cultural contexts.

These findings contribute to the growing body of cross-cultural research by highlighting the nuanced roles of socio-cognitive determinants in dietary behavior. The results extend the I-Change Model by emphasizing the contextual variability of constructs like social influence and self-efficacy across cultural settings (Kok et al., 2021; de Vries, 2017). They also align with global studies on the Theory of Planned Behavior, reaffirming intention as a universal predictor while illustrating how cultural norms shape its antecedents (Armitage & Conner, 2001; Michie et al., 2013). In the Middle East, findings underscore the importance of tailoring interventions to address cultural values and practical barriers, while in Western contexts like the UK, strategies should focus on autonomy and self-regulation (Culliford & Bradbury, 2023; Musaiger, 2020).

### **7.3. Leveraging Behavior Change Techniques (BCTs) for Digital Health Interventions**

#### ***7.3.1. Introduction to BCTs and Digital Health***

The integration of Behavior Change Techniques (BCTs) into digital health interventions offers a transformative approach to promoting sustainable dietary behavior change. These techniques, grounded in socio-cognitive theories and tailored to cultural contexts, can address barriers and motivators effectively in both the UK and Jordan. By leveraging digital platforms, interventions can enhance accessibility, scalability, and personalization, making them a critical component of modern public health strategies (Michie et al., 2011; Kok et al., 2021; Mummah et al., 2016). Aligning Key Determinants with BCTs Risk Perception and Communication Risk communication is a cornerstone BCT that enhances individuals' awareness of the consequences of unhealthy eating. Personalized and

culturally sensitive messages addressing obesity-related risks have been shown to motivate behavioral changes. For example, localized dietary guidelines that resonate with Jordanian cultural values or UK-specific health narratives can increase relevance and uptake (Ahmed, 2024; Borrelli & Ritterband, 2015).

Middle Eastern studies underscore the role of community-centric messaging to tackle the stigma around obesity (Alsairi, 2024; Musaiger, 2020). Goal Setting and Intention Strengthening Behavioral intention, identified as a strong predictor in both settings, can be effectively operationalized through goal-oriented BCTs such as goal setting and action planning. Digital tools can facilitate this by enabling users to set personalized dietary targets, providing reminders, and rewarding progress through gamified features. Studies highlight the success of such approaches in fostering adherence to health goals, particularly among younger demographics (Linardon et al., 2023; Zhang et al., 2024).

In Jordan, the collectivist nature of society highlights the importance of leveraging social influence through peer support and group-based activities. Digital interventions can integrate community forums, virtual group challenges, and influencer endorsements to foster collective motivation (Al-Hazzaa et al., 2018; Arigo et al., 2019; Musaiger, 2020). Conversely, in the UK, interventions may benefit from tools that emphasize autonomy and self-regulation, such as self-monitoring apps or guided action plans (Brug et al., 2006; Kok et al., 2021).

### ***7.3.2. Digital Platforms as Vehicles for BCTs***

Self-Monitoring and Feedback Digital platforms offer robust self-monitoring tools, such as dietary tracking apps and wearable devices, which enable users to monitor their intake and physical activity in real time. Evidence supports the effectiveness of these tools in promoting accountability and sustained engagement (Chen & Pu, 2023; Michie et al., 2011; Arigo et al., 2019). Apps like MyFitnessPal demonstrate the potential of combining tracking features with personalized feedback and educational modules tailored to cultural contexts (Mummah et al., 2016). Risk Communication through Interactive Features Interactive digital tools such as quizzes, video content, and push notifications allow for dynamic risk communication. Tailoring these features to resonate with specific cultural

and demographic audiences enhances engagement and effectiveness, as evidenced by interventions in the Middle East and Europe (Alsheweir et al., 2023; Michie et al., 2013).

Another example would be addressing practical barriers through environmental restructuring; In Jordan, where cost and time constraints are significant barriers, environmental restructuring techniques embedded within apps can offer solutions. For instance, affordable meal planning features and partnerships with local food suppliers to provide discounts on healthy foods have been shown to address accessibility challenges (Tariq et al., 2022; Alkasasbeh & Alawamleh, 2024). In the UK, video tutorials or structured cooking lessons integrated into apps could help users move away from reliance on convenience foods (Culliford & Bradbury, 2023; Mummah et al., 2016)

## **7.4. Limitations of the Study**

While this research provides significant insights into the socio-cognitive determinants of eating moderation in the UK and Jordan, several limitations should be noted. These considerations are critical for interpreting the findings and planning future studies.

### ***7.4.1. Sample Composition***

The study predominantly relied on self-reported data, which may introduce biases such as social desirability and underreporting, especially in dietary behavior research (Hebert et al., 2008; Kye et al., 2014). The sample size, though sufficient for the study's scope, may not be fully representative of the broader populations in both the UK and Jordan. Variability in socio-economic, educational, and regional demographics was limited, potentially influencing generalizability. Cultural biases may also have influenced self-reporting, especially in collectivist contexts like Jordan, where social desirability may have influenced responses about social influence and self-efficacy (Triandis, 1995). This is an important consideration when interpreting data from collectivist cultures, as responses might reflect societal norms rather than actual behaviors.



#### ***7.4.2. Cultural and Contextual Constraints***

The research focused on two distinct cultural contexts, limiting its applicability to other collectivist or individualist societies. Future studies should include more countries to strengthen cross-cultural comparisons (Berry et al., 1997). Operationalizing constructs like self-efficacy and social influence in culturally diverse settings posed challenges. Variations in interpreting survey items may have affected the outcomes.

#### ***7.4.3. Digital Intervention Exploration***

While the findings suggest pathways for digital health applications, no direct intervention or longitudinal testing of digital tools was conducted. The proposed integration of Behavior Change Techniques (BCTs) into digital platforms remains theoretical. The impact of emerging technologies like AI and gamification on behavior change was discussed but not empirically tested, limiting practical implications (Mummah et al., 2016; Moller et al., 2017).

#### ***7.4.4. COVID-19 Considerations***

Data collection during the COVID-19 pandemic was conducted online and, therefore, was not directly impacted by pandemic-related restrictions. The study design, including aims and methodology, remained unchanged as advised by supervisory guidance since it was not a part of our main goals and aims. However, it is acknowledged that participants' responses, particularly regarding socio-cognitive factors like social influence and practical barriers, may have been influenced by the broader contextual environment of the pandemic (Deschasaux-Tanguy et al., 2021). This was not explicitly measured in the study, and future research could consider the contextual effects of external crises like COVID-19 on eating behaviors.

#### ***7.4.5. Temporal and Longitudinal Insights***

The cross-sectional nature of the quantitative study limits insights into causality and the long-term impact of identified socio-cognitive determinants on eating behaviors. Future



longitudinal research could explore how constructs like intention and self-efficacy evolve over time and their sustained influence on dietary behaviors (Armitage & Conner, 2001).

## **7.5. Implications for Future Research**

While this study provides important insights into socio-cognitive determinants of eating moderation in the UK and Jordan, there are several ways future research could expand on and refine these findings.

### ***7.5.1. Addressing Methodological Limitations***

Future research should prioritize addressing the limitations of this study. This includes expanding sample sizes to enhance generalizability and incorporating longitudinal designs to evaluate sustained behavioral changes over time (Armitage & Conner, 2001). Additionally, studies should include more diverse populations, particularly marginalized groups, to capture a broader spectrum of socio-cognitive determinants and their interaction with cultural contexts (Hebert et al., 2008). This will provide more robust data to inform public health interventions across diverse settings.

### ***7.5.2. Exploring Determinants and Theoretical Extensions***

Constructs like self-efficacy, which were not significant in this study, warrant further exploration in cross-cultural settings. Researchers could investigate whether alternative operationalizations or additional contextual factors, such as social stigma or access to resources, influence their predictive power (Bandura, 1997; Triandis, 1995). Furthermore, integrating other health behavior models, such as the Health Belief Model or Social Cognitive Theory, alongside the I-Change Model, may provide richer insights into dietary behavior (Glanz et al., 2008). Cross-cultural validation of these models could illuminate differences in how constructs operate across diverse settings.

### ***7.5.3. Evaluating Digital Intervention Efficacy***

The integration of behavior change techniques into digital platforms offers promising avenues for public health strategies. However, future trials should rigorously evaluate

their long-term effectiveness and scalability across cultural settings (Michie et al., 2011; Mummah et al., 2016). Comparative studies could examine the impact of different digital tools, such as AI-driven platforms versus traditional eHealth approaches, on user engagement and behavior change. For instance, studies could analyze the role of adaptive AI in enhancing engagement in resource-limited settings.

#### ***7.5.4. Leveraging Emerging Technologies***

AI and machine learning hold significant potential for creating adaptive, personalized interventions tailored to users' unique preferences and behaviors (Chen & Pu, 2023). Future research should explore the effectiveness of these technologies in real-world settings, particularly in resource-constrained environments (Moller et al., 2017). Moreover, gamification elements and virtual reality tools could be tested for their ability to enhance motivation and sustain long-term dietary changes (Zhang et al., 2024). These technologies have shown promise in other health domains and could significantly impact dietary behaviors.

#### ***7.5.5. Studying Intersectionality in Behavioral Determinants***

Further studies should investigate the intersectionality of factors like gender, socio-economic status, and age in shaping dietary behaviors (Hebert et al., 2008). For example, exploring how economic disparities interact with cultural norms and self-efficacy could provide actionable insights for tailoring interventions to specific subgroups (Berry et al., 1997; Culliford & Bradbury, 2023). Intersectional research could help uncover nuanced barriers and motivators, particularly in collectivist settings where community dynamics play a critical role.

#### ***7.5.6. Bridging Research with Policy***

Collaborative efforts between researchers, policymakers, and healthcare providers are essential for translating findings into practice. Future studies should evaluate the effectiveness of integrating evidence-based digital tools within existing healthcare systems, particularly in low-resource settings like Jordan (Deschasaux-Tanguy et al., 2021). For example, research could explore the integration of gamified meal planning

apps with government-sponsored nutritional programs or healthcare workflows in rural areas.

## **7.6. Conclusion**

This thesis provides a comprehensive exploration of the socio-cognitive determinants and associated beliefs influencing eating moderation across two culturally distinct populations: the UK and Jordan. Grounded in the I-Change Model and employing a mixed-methods approach, the research examined determinants such as risk perception, intention, social influence, and self-efficacy. The findings reveal how these beliefs shape dietary behaviors within their cultural contexts.

The research highlights both shared and divergent pathways in health behaviors, emphasizing the interplay between individual cognition and broader cultural influences. Similarities, such as the predictive power of risk perception and intention, were observed, while differences underscored the role of social norms in Jordan's collectivist society compared to the self-regulatory focus in the UK's individualistic context. This nuanced understanding emphasizes the importance of tailoring public health interventions to specific cultural contexts.

Key contributions of this thesis include its integration of theoretical models, cross-cultural analysis, and the application of Behavior Change Techniques (BCTs). These contributions pave the way for culturally sensitive and scalable solutions, particularly through digital platforms that embed BCTs like goal setting, self-monitoring, and tailored risk communication. Additionally, the study offers actionable insights for addressing barriers, such as cost and accessibility, which are more pronounced in resource-constrained settings like Jordan.

To achieve true behaviour change, it is essential to explore individuals' beliefs in greater depth. Beliefs shape behavior, and by identifying the specific beliefs surrounding the key determinants of the I-Change Model in the UK and Jordan, interventions can be effectively tailored to address unique motivators and barriers in each population. This ensures that interventions directly target the most relevant factors, maximizing their impact.

In conclusion, this thesis provides a robust foundation for advancing public health strategies that are culturally relevant, theoretically grounded, and practically applicable. By addressing the core socio-cognitive determinants of eating in moderation, this research emphasises the critical need to understand and target the underlying beliefs that shape these determinants. The findings highlight the importance of tailoring interventions to specific cultural contexts, recognising that strategies effective in individualistic societies like the UK may not be as impactful in collectivist cultures such as Jordan. As such, future interventions should prioritise culturally sensitive approaches, leveraging local norms and family dynamics to enhance engagement and effectiveness. Additionally, the integration of emerging technologies, such as AI, holds transformative potential for creating personalized digital health tools that resonate with users' unique preferences and behaviors.

Ultimately, this work not only contributes to academic literature but also offers actionable insights that can inform public health policies, guiding future health interventions on a global scale. By ensuring that these strategies are grounded in the socio-cognitive determinants identified in this study, we can effectively tackle the pressing issue of obesity and promote healthier dietary behaviors across diverse populations.

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# APPENDIX

## Appendix A: Invitation Ad in English (UK)



College of Health, Medicine and Life Sciences  
Department of Life Sciences

### INVITATION AD

Hello,

I am Rama Abu Hammour and I am now recruiting male and female participants for my PhD study. Please see the ad below for details.

#### Research Participation Invitation

Hello everyone!

Have you ever wondered what factors affect your healthy eating behaviours? I am conducting interviews as part of my PhD research study to improve our understanding of people's healthy eating behaviours, specifically overweight and obese adults, and how different factors either motivate or limit them. Your perception and insight will provide valuable information to the study. How can you help?

Are you eligible?

- Aged 18 years or above

The interview will take on average 45 minutes to 1 hour. The interview will be a friendly and informal one. It will take place either on Zoom or Skype software. Your responses to the questions will be audio recorded using other software and remain confidential and anonymous.

If you are interested in the study and willing to participate, please do email me to arrange a meeting. Furthermore, if you have any more questions, please do not hesitate to contact me.

Rama Abu Hammour on [1832689@brunel.ac.uk](mailto:1832689@brunel.ac.uk). Thank you once again.

## Appendix B: Invitation Ad in Arabic (Jordan)

مرحباً،

أنا راما أبو حمور وأقوم الآن بتوظيف المشاركين من الذكور والإناث في دراسة الدكتوراه. يرجى الاطلاع على الإعلان أدناه للحصول على التفاصيل. سوف تتلقى 10 جنيهات مقابل وقتك. يرجى الاتصال إذا كنت ترغب في المشاركة أو إذا كان لديك أي أسئلة. يمكنك إرسال رسالة على Facebook أو مراسلتي عبر البريد الإلكتروني على [brunel.ac.uk@1832689](mailto:brunel.ac.uk@1832689)

### دعوة للمشاركة في البحث

"الميسرات الاجتماعية والمعرفية والعوائق التي تحول دون تناول الطعام الصحي لدى البالغين الذين يعانون من زيادة الوزن والسمنة في عدة مناطق جغرافية"

هناك حاجة لمتطوعين من الذكور والإناث تبلغ أعمارهم 18 عامًا أو أكثر للمشاركة في دراسة تبحث في فهمنا لسلوكيات الأكل الصحية لدى الأشخاص ، وخاصة البالغين الذين يعانون من زيادة الوزن والسمنة ، وكيف تحفز العوامل المختلفة أو تحد منها. يجري هذا البحث من قبل طالبة الدكتوراه (راما أبو حمور) بصفتها الباحث الرئيسي تحت إشراف الدكتور تيري دوفي والدكتور كي

سيحصل المشاركون على 10 جنيهات كتعويض عن وقتهم.

"مرحبًا بالجميع ، هل تساءلت يومًا عن العوامل التي تؤثر على سلوكيات الأكل الصحي لديك؟ أجري مقابلات كجزء من دراستي البحثية لنيل درجة الدكتوراه لتحسين فهمنا لسلوكيات الأكل الصحية لدى الناس ، وخاصة البالغين الذين يعانون من زيادة الوزن والسمنة ، وكيف تحفز العوامل المختلفة أو تحد منها. سيوفر إدراكك ورؤيتك معلومات قيمة للدراسة. أنا راما أبو حمور ، مروج صحة عامة وباحثة دكتوراه ستقود هذا البحث في جامعة Brunel ، لندن."

ستستغرق المقابلة في المتوسط 45 دقيقة إلى ساعة واحدة. ستكون المقابلة ودية وغير رسمية. سيحدث إما على برنامج Zoom أو Skype. سيتم تسجيل ردودك على الأسئلة بالصوت باستخدام برنامج قضاة وتبقى سرية ومجهولة الهوية.

## Appendix C: PIS UK



College of Health, Medicine and Life Sciences

Department of Life Sciences

### Participant Information Sheet

#### Socio-cognitive facilitators and barriers towards healthy eating in overweight and obese adults in several geographical areas

You are being asked to take part in a research study. 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. Ask me 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 reading this.

#### What is the purpose of the study?

The purpose of this study is to explore the socio-cognitive beliefs that overweight and obese adults have towards their healthy eating behaviours. By understanding the factors that might facilitate or limit healthy eating patterns as and knowledge of important determinants of a proper healthy eating lifestyle is essential for the development of effective public health interventions

#### Why have I been invited to participate?

You are an adult who is 18 years or above, have a BMI of 25 kg/m<sup>2</sup> or above and is interested in taking part of this study which explores your healthy eating behaviours.

#### Do I have to take part?

Your participation is entirely voluntary. Furthermore, in the case where you have decided to take part in the study and then changed your mind, you are still free to withdraw without providing a reason until the thesis paper is published.

#### What will happen to me if I take part?

After you have read this information, you will be asked to complete a Consent Form. If you are willing to participate, I will then arrange a suitable date and time to meet via Zoom/Skype or any online software you prefer. The interview will take approximately 45 minutes to one hour, and it will include questions about your eating behaviours and some general questions

about your eating patterns. The questions' nature will be open-ended which will give you the freedom to discuss and give your responses however you decide to. Once the interview is completed, you will be given the opportunity to ask any questions you may have about the study. You will also be given the research team's contact details before you leave.

**Are there any lifestyle restrictions?**

There are no lifestyle restrictions.

**What are the possible disadvantages and risks of taking part?**

There are no anticipated disadvantages or risks associated with taking part in this study. However, if you feel any discomfort after the interview you could contact the research team if you have any concerns.

**What are the possible benefits of taking part?**

There is no intended benefit to the participants. However, It will provide useful insight to the determinants of a proper healthy eating lifestyle and thereby develop effective public health interventions.

**What if something goes wrong?**

There is no harm or danger in taking part of this research study. If however; you do have any further enquiries, you can contact the Research Ethics Committee, College of Health, Medicine and Life Sciences - Department of Life Sciences: [DLS-Ethics@brunel.ac.uk](mailto:DLS-Ethics@brunel.ac.uk).

**Will my taking part in this study be kept confidential?**

All collected data will be stored safely and securely in the Brunel university server. All participants' data will be treated confidentially. The study data will be anonymised and coded immediately after collection. The data will not be used to identify any individual data at any time. Furthermore, participants' identities will not be disclosed to any third party. The linking coding documentation will be stored separately to maintain participants' right to withdraw their participation. For data analysis, only the anonymised data will be used by the researcher and can be used in future research.

**Will I be recorded, and how will the recording be used?**

All the interviews will be audio recorded using Otter software. The recordings will be used in the generation of findings.

**What will happen to the results of the research study?**

The results of the study will form a part of my doctoral research thesis. The anonymised data will be used to generate results of this study and will be reviewed academically by researchers at Brunel University. The results may also be presented at a conference and/or published in an academic journal. Furthermore, the interview transcript can be shared with other researchers to be used in future research. No individual data will be published, and you will not be identified in any way from these transcripts.

**Who is organising and funding the research?**

The research has been organised and funded by the researcher as well as Brunel University.

**What are the indemnity arrangements?**

Brunel University London provides appropriate insurance cover for research which has received ethical approval.

**Who has reviewed the study?**

This research has been reviewed and approved by the College of Health, Medicine and Life Sciences Research Ethics Committee.

**Research Integrity**

Brunel University London is committed to compliance with the Universities UK [Research Integrity Concordat](#). You are entitled to expect the highest level of integrity from the researchers during the course of this research

**Contact for further information and queries****Researcher name and details:**

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**For complaints, Chair of the Research Ethics Committee:**

Professor Christina Victor, Chair College of Health, Medicine and Life Sciences Research Ethics Committee [Christina.Victor@brunel.ac.uk](mailto:Christina.Victor@brunel.ac.uk)

Thank you very much for reading this document.

## Appendix D: PIS JO



College of Health, Medicine and Life Sciences

Department of Life Sciences

### ورقة معلومات المشارك

الميسرات الاجتماعية والمعرفية والعوائق التي تحول دون تناول الطعام الصحي لدى البالغين الذين يعانون من زيادة الوزن والسمنة في عدة مناطق جغرافية

يُطلب منك المشاركة في دراسة بحثية. قبل أن تقرر ، من المهم أن تفهم سبب إجراء البحث وما الذي سيتضمنه. يرجى تخصيص بعض الوقت لقراءة المعلومات التالية بعناية ومناقشتها مع الآخرين إذا كنت ترغب في ذلك. أسألني إذا كان هناك أي شيء غير واضح أو إذا كنت ترغب في مزيد من المعلومات. خذ وقتك لتقرر ما إذا كنت ترغب في المشاركة أم لا. شكرًا لقراءتك هذا.

ما هو الغرض من الدراسة؟

الغرض من هذه الدراسة هو استكشاف المعتقدات الاجتماعية المعرفية لدى البالغين الذين يعانون من زيادة الوزن والسمنة تجاه سلوكياتهم الغذائية الصحية. باستخدام النماذج النفسية ، سوف نستكشف العوامل التي قد تسهل أو تحد من أنماط الأكل الصحي. ستساعد نتائج هذه الدراسة أيضًا في تزويد الاستبيانات والمراحل التالية من دراستنا بالمعلومات.

لماذا تمت دعوتي للمشاركة؟

بعد مشاهدة الإعلان على المجموعة ، قررت المشاركة في دراستنا وكنت مؤهلاً للقيام بذلك بناءً على معايير الاختيار لدينا: متطوعون أو إناث يبلغون من العمر 18 عامًا أو أكثر ولديهم مؤشر كتلة الجسم 25 كجم / م<sup>2</sup> أو أعلى .

هل يجب علي المشاركة؟  
مشاركتم طوعية تماما. علاوة على ذلك ، في الحالة التي قررت فيها المشاركة في الدراسة ثم غيرت رأيك ، فلا يزال بإمكانك الانسحاب دون تقديم سبب حتى يتم نشر ورقة الأطروحة.

ماذا سيحدث لي إذا شاركت؟  
بعد قراءة هذه المعلومات ، سيُطلب منك إكمال نموذج الموافقة. إذا كنت على استعداد للمشاركة ، فسنختار بعد ذلك التاريخ والوقت المناسبين لك للقاء عبر Zoom / Skype أو أي برنامج عبر الإنترنت تفضله.  
ستكون المقابلة ودية وغير رسمية. نحن مهتمون بالتعرف على تجاربك في حياتك وكيف تشعر حيال نظامك الغذائي وما تأكله ، وكم تأكل ومدى صحة عاداتك الغذائية. ستتمتع بحرية المناقشة وإعطاء إجاباتك كيفما قررت ذلك.  
بمجرد الانتهاء من المقابلة ، ستتاح لك الفرصة لطرح أي أسئلة قد تكون لديك حول الدراسة. ستحصل أيضًا على تفاصيل الاتصال بفريق البحث قبل المغادرة. سيتم تحليل إجاباتك على الأسئلة جنبًا إلى جنب مع المشاركين الآخرين لإنشاء موضوعات من شأنها أن تساعد في إرشاد الدراسات المستقبلية في الدكتوراه الخاصة بي لاستكشاف تغيير السلوك الغذائي. يمكن استخدام الاقتباسات من مقابلتك في الأطروحة أو نشرها في مجلة أكاديمية.

هل هناك أي قيود على نمط الحياة؟  
لا ، لا توجد قواعد محددة يجب أخذها بعين الاعتبار قبل المقابلة.

ما هي العيوب والمخاطر المحتملة للمشاركة؟

لا توجد عيوب أو مخاطر متوقعة مرتبطة بالمشاركة في هذه الدراسة.  
ومع ذلك ، إذا شعرت بأي إزعاج بعد المقابلة ، يمكنك الاتصال بي أو الاتصال  
ببقية فريق البحث إذا كانت لديك أية مخاوف.

ما هي فوائد ممكنة من المشاركة؟

ستوفر نتائج المقابلة نظرة ثاقبة مفيدة وتضع الأساس لأسئلة الأسئلة التي سيتم  
تشكيلها للمرحلة التالية من بحثنا.

كتعويض عن وقتك ، ستحصل على 10 جنيهات إذا قررت المشاركة في  
الدراسة.

ماذا لو حدث خطأ ما؟

لا نتوقع حدوث أي خطأ أثناء المقابلة ؛ ومع ذلك ، في حالة حدوث ذلك غير  
المحتمل ، سوف نتحدث معك بسعادة ونوجهك إلى الدعم الذي تحتاجه.  
بدلاً من ذلك ، يمكنك أيضاً الاتصال بلجنة أخلاقيات البحث ، كلية الصحة ،  
الطب وعلوم الحياة - قسم علوم الحياة: DLS-  
Ethics@brunel.ac.uk

هل ستبقى مشاركتي في هذه الدراسة سرية؟

سيتم تخزين جميع البيانات التي تم جمعها بأمان وأمان في خادم جامعة  
Brunel. سيتم التعامل مع جميع بيانات المشاركين بشكل سري. سيتم إخفاء  
هوية بيانات الدراسة وترميزها فور جمعها. لن يتم استخدام البيانات لتحديد أي  
بيانات فردية في أي وقت. علاوة على ذلك ، لن يتم الكشف عن هويات  
المشاركين لأي طرف ثالث. سيتم تخزين وثائق الترميز المرتبطة بشكل منفصل  
للحفاظ على حق المشاركين في المشاركة. لتحليل البيانات ، سيتم استخدام  
البيانات مجهولة المصدر فقط من قبل الباحث ويمكن استخدامها في البحث  
المستقبلي.

هل سأُسجَل وكيف سيتم استخدام التسجيل؟  
سيتم تسجيل جميع المقابلات بالصوت باستخدام برنامج Otter. سيتم بعد ذلك نسخ التسجيلات وترميزها. سيتم بعد ذلك حذف التسجيلات الصوتية ولن يتم نشر أي بيانات فردية ولن يتم التعرف عليك بأي شكل من الأشكال من هذه النصوص.

ماذا سيحدث لنتائج الدراسة البحثية؟  
ستشكل نتائج الدراسة جزءاً من أطروحة بحث الدكتوراه الخاصة بي. سيتم استخدام البيانات مجهولة المصدر لتوليد نتائج هذه الدراسة وستتم مراجعتها أكاديمياً من قبل الباحثين في جامعة بروني. يمكن أيضاً تقديم النتائج في مؤتمر و / أو نشرها في مجلة أكاديمية. علاوة على ذلك ، يمكن مشاركة نص المقابلة مع باحثين آخرين لاستخدامه في الأبحاث المستقبلية.

من يقوم بتنظيم وتمويل البحث؟  
تم تنظيم البحث وتمويله من قبل الباحث وكذلك جامعة بروني.

ما هي ترتيبات التعويض؟  
توفر جامعة بروني لندن تغطية تأمينية مناسبة للأبحاث التي حصلت على الموافقة الأخلاقية.

من قيم هذه الدراسة؟  
تمت مراجعة هذا البحث واعتماده من قبل لجنة أخلاقيات البحث في كلية الصحة والطب وعلوم الحياة.  
نزاهة البحث  
تلتزم جامعة بروني بلندن بالامتنال لاتفاق النزاهة البحثية للجامعات البريطانية.  
يحق لك توقع أعلى مستوى من النزاهة من الباحثين عن إعادة البحث أثناء إجراء هذا البحث  
اتصل لمزيد من المعلومات والاستفسارات

اسم الباحث وتفاصيله:  
الباحث: راما أبو حمور 1832689@brunel.ac.uk  
مبنى جاسكل  
كلية الصحة والطب وعلوم الحياة  
جامعة برونييل لندن  
كينغستون لين  
Uxbridge UB8 3PH

اسم وتفاصيل المشرف الأساسي:  
الدكتور تيري دوفي  
قائد القسم / القارئ - علم النفس  
مبنى جاسكل 262  
كلية الصحة والطب وعلوم الحياة - CHMLS  
جامعة برونييل لندن  
أوكسبريدج UB8  
266617 1895 44+  
terry.dovey@brunel.ac.uk

اسم وتفاصيل المشرف الثانوي:  
الدكتور كي لونج تشيونغ  
محاضر في الصحة العامة  
ماري سيكول 201 أ  
كلية الصحة والطب وعلوم الحياة - CHMLS  
جامعة برونييل لندن  
أوكسبريدج UB8  
هاتف: 266728 1895 (0) 44+  
keilong.cheung@brunel.ac.uk

للتشكاوي رئيس لجنة أخلاقيات البحث:

البروفيسور كريستينا فيكتور ، رئيس لجنة أخلاقيات أبحاث كلية الصحة والطب  
وعلوم الحيا

`louise.mansfield@brunel.ac.uk`

شكرا جزيلا لقراءة هذه الوثيقة لك.

## Appendix E: Consent Form UK



### Online Consent Form Template

Please confirm the following:

	Yes	No
<ul style="list-style-type: none"><li>I have read the Participant Information Sheet included with this questionnaire</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"><li>I am over the age of 18</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"><li>I understand that no personal identifying data is collected in this study, therefore I know that once I have submitted my answers I am unable to withdraw my data from the study</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"><li>I agree that my data can be anonymised, stored and used in future research in line with Brunel University's data retention policies</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"><li>I agree to take part in this study</li></ul>	<input type="checkbox"/>	<input type="checkbox"/>



## Appendix F: Consent Form Jordan



نموذج الموافقة عبر الإنترنت

يرجى تأكيد ما يلي:

نعم / لا

• لقد قرأت ورقة معلومات المشارك المضمنة في هذا الاستبيان

• عمري يزيد عن 18 عامًا  
• أفهم أنه لا يتم جمع أي بيانات تعريف شخصية في هذه الدراسة ، لذلك أعلم أنه بمجرد تقديم إجاباتي ، لا يمكنني سحب بياناتي من الدراسة

• أوافق على إمكانية إخفاء هوية بياناتي وتخزينها واستخدامها في البحث المستقبلي بما يتماشى مع سياسات الاحتفاظ بالبيانات في جامعة Brunel

• أوافق على المشاركة في هذه الدراسة

مؤشر الأكل الصحي القصير

## Appendix G: Demographic UK

College of Health, Medicine and Life Sciences  
Department of Life Sciences



### Demographic Questionnaire

1. How old are you?

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or older

2. What is your weight and height? (Please type your response)

- Weight: \_\_\_\_\_ (kg/lbs)
- Height: \_\_\_\_\_ (cm/inches)

3. What is your gender?

- Female
- Male
- Prefer not to say

4. What is your highest level of education?

- High School
- College
- Graduate
- Prefer not to say

5. What is your approximate level of income per year?

- Less than \$25,000
- \$25,000-\$50,000
- \$50,000-\$100,000
- More than \$100,000
- Prefer not to say

6. What is your marital status?

- Married
- Single
- Divorced
- Widowed
- Prefer not to say

7. Over the last 12 months, would you say that overall your health has been:

- Excellent
- Very good
- Poor

8. Do you suffer from any chronic diseases, specifically the following? (Check all that apply)

- Diabetes
- Cardiovascular Issues
- None

9. Are you pregnant?

- Yes
- No

## Appendix H: Demographic Jordan



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### استبيان ديموغرافي

1. كم عمرك؟

- أقل من 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- أو أكثر 65

2. ما هو وزنك وطولك؟ (يرجى كتابة الإجابة)

- (الوزن ؛) \_\_\_\_\_ كجم/رطل (-)
- (الطول) \_\_\_\_\_ سم/إنش (-)

3. ما هو جنسك؟

- أنثى -
- ذكر -
- أفضل عدم الإجابة -

4. ما هو أعلى مستوى تعليمي حصلت عليه؟

- المدرسة الثانوية -
- الكلية -
- الدراسات العليا -
- أفضل عدم الإجابة -

5. ما هو مستوى دخلك السنوي التقريبي؟

- أقل من 25,000 دولار -
- 25,000-50,000 دولار -
- 50,000-100,000 دولار -

- أكثر من 100,000 دولار -
- أفضل عدم الإجابة -

6. ما هي حالتك الاجتماعية؟

- متزوج/ة -
- أعزب/ة -
- مطلق/ة -
- أرمل/ة -
- أفضل عدم الإجابة -

7. خلال الاثني عشر شهراً الماضية، كيف تصف حالتك الصحية بشكل عام؟

- ممتازة -
- جيدة جداً -
- ضعيفة -

8. هل تعاني من أي أمراض مزمنة، وتحديداً ما يلي؟ (يرجى اختيار جميع ما ينطبق.)

- السكري -
- مشاكل في القلب والأوعية الدموية -
- لا شيء -

9. هل أنت حامل؟

- نعم -
- لا -

## Appendix I: Interview UK



College of Health, Medicine and Life Sciences  
Department of Life Sciences

### INTERVIEW SCHEDULE:

#### **\*Introductory Questions:**

1. What are your favourite foods?
2. What does your diet look like on a daily or weekly basis?
3. What do you like/hate about food preparation or meal planning?
4. Do you usually have take out food? If so, how frequent do you do that?
5. Do you feel like there are things that stop people from choosing healthy food options? If so, what are they?
6. Are you are good cook?
7. Who cooks most in your family?
8. How do you feel about family and friend gatherings when it comes to food?
9. Do you work? / study at university?

#### **Specific questions in accordance with the I-behavioural change model:**

**Knowledge:** What is considered healthy eating and what do you know about eating in moderation in your opinion?

**Risk perception:** Do you think there are any risks associated with not eating in moderation?

-If so, what are these risks?

-Do you think these risks that you mentioned have serious consequences on your health?)

**Attitude:**

Are there any advantages for eating in moderation in your opinion?

Are there any disadvantages for eating in moderation in your opinion?  
If so, what are they?

- a. Expected negative experiences (short-term or long term)

**Social influence:**

**Social support:**

Do you feel like you have support when it comes to eating in moderation?

Who would be against you if you decide to start eating more healthy and moderate meals?

Other people (family, friends, peers.....)

Social and environmental factors (social attitude and influence, insurance, financial issues, media/advertisement...)

Health system (Health service and Health provider, Access)

**Social norms:**

What do the people around you think about eating in moderation?  
(family, friends, peers. Country)

Do you think they consider it important?

**Social modelling:**

Do you think people around you eat in moderation?

**Self-efficacy:**

Do you find it difficult to start eating in moderation?

If so, what factors would make it challenging for you to start eating in moderation?

**Intention and action plans**

Do you intend to start eating healthier and specifically eating in moderation in the near future?

When do you think you will start?

If someone wants to start eating healthier and specifically eating in moderation, what do you think he/she should start doing?

If the plan fails, should he/she give up? Or find other alternative ways?



## Appendix J: Interview Jordan



College of Health, Medicine and Life Sciences

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### جدول مقابلة

\* أسئلة تمهيدية:

1. ما هي الأطعمة المفضلة لديك؟
- 2- كيف يبدو نظامك الغذائي على أساس يومي أو أسبوعي؟
3. ما الذي يعجبك / تكرهه في إعداد الطعام أو التخطيط للوجبات؟
4. هل عادة ما تتناول الطعام خارج المنزل؟ إذا كان الأمر كذلك ، ما مدى تكرار القيام بذلك؟
5. هل تشعر أن هناك أشياء تمنع الناس من اختيار خيارات الطعام الصحي؟ إذا كان الأمر كذلك، ما هي؟
6. هل أنت طباخة ماهرة؟
7. من الذي يطبخ أكثر في عائلتك؟
8. ما هو شعورك تجاه التجمعات العائلية والأصدقاء عندما يتعلق الأمر بالطعام؟
9. هل تعمل؟ / يدرس في الجامعة؟

أسئلة محددة وفقاً لنموذج التغيير السلوكي I:

المعرفة: ما يعتبر الأكل الصحي وماذا تعرف عن الأكل باعتدال في رأيك؟

تصور المخاطر: هل تعتقد أن هناك أي مخاطر مرتبطة بعدم تناول الطعام باعتدال؟

- إذا كان الأمر كذلك فما هي هذه المخاطر؟

- هل تعتقد أن هذه المخاطر التي ذكرتها لها عواقب وخيمة على صحتك؟

سلوك:

هل هناك مزايا لتناول الطعام باعتدال في رأيك؟

هل هناك عيوب في الأكل باعتدال في رأيك؟

إذا كان الأمر كذلك، ما هي؟

أ. التجارب السلبية المتوقعة (قصيرة المدى أو طويلة المدى)

التأثير الاجتماعي:

دعم اجتماعي:

هل تشعر أنك تحصل على الدعم عندما يتعلق الأمر بتناول الطعام باعتدال؟

من سيكون ضدك إذا قررت البدء في تناول وجبات صحية ومعتدلة؟

أشخاص آخرون (العائلة والأصدقاء والأقران ...)  
العوامل الاجتماعية والبيئية (الموقف الاجتماعي والتأثير ، التأمين ، القضايا المالية ، الإعلام / الإعلان ...)  
النظام الصحي (الخدمات الصحية ومقدم الخدمات الصحية ، الوصول)  
الأعراف الاجتماعية:

ما رأي الناس من حولك في تناول الطعام باعتدال؟  
(العائلة والأصدقاء والأقران. البلد)

هل تعتقد أنهم يعتبرونها مهمة؟

النمذجة الاجتماعية:  
هل تعتقد أن الناس من حولك يأكلون باعتدال؟

الفعالية الذاتية:

هل تجد صعوبة في تناول الطعام باعتدال؟

إذا كان الأمر كذلك ، فما العوامل التي تجعل من الصعب عليك البدء في تناول الطعام باعتدال؟

النية وخطط العمل



هل تنوي البدء في تناول الطعام الصحي والاعتدال على وجه التحديد في المستقبل القريب؟

متى تعتقد أنك ستبدأ؟

إذا أراد شخص ما البدء في تناول الطعام الصحي وتحديدًا تناول الطعام باعتدال ، فماذا تعتقد أنه يجب أن يبدأ في القيام به؟

إذا فشلت الخطة ، فهل يستسلم؟ أو إيجاد طرق بديلة أخرى؟

## Appendix K: Ethics

	<p>College of Health, Medicine and Life Sciences Research Ethics Committee (DLS) Brunel University London Kingston Lane Uxbridge UB8 3PH United Kingdom <a href="http://www.brunel.ac.uk">www.brunel.ac.uk</a></p>
<p>10 June 2021</p>	
<p><b>LETTER OF CONDITIONAL APPROVAL</b></p>	
<p>APPROVAL HAS BEEN GRANTED FOR THIS STUDY TO BE CARRIED OUT BETWEEN 10/06/2021 AND 01/10/2021</p>	
<p>Applicant (s): Mrs Rama Abu Hammour</p> <p>Project Title: Facilitators and Barriers towards healthy eating in overweight and obese adults in several geographical locations</p> <p>Reference: 29846-LR-May/2021- 32689-1</p>	
<p>Dear Mrs Rama Abu Hammour</p> <p>The Research Ethics Committee has considered the above application recently submitted by you.</p> <p>The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:</p> <ul style="list-style-type: none"><li>• Advert - Please add to the advert that the study has been approved by the College of Health, Medicine and Life Sciences Research Ethics Committee and add the approval start date and the expiry date (your end date) of your study.</li> <li>• A18 – PIS – Please amend the contact for further information and complaints to Professor Louise Mansfield, Chair College of Health, Medicine and Life Sciences Research Ethics Committee, <a href="mailto:Louise.Mansfield@brunel.ac.uk">Louise.Mansfield@brunel.ac.uk</a></li> <li>• A18 – PIS – 'What if something goes wrong' - Please change to the text within the PIS guidance on the College Research Ethics IntraBrunel page at <a href="https://intra.brunel.ac.uk/chls/research/Pages/default.aspx">https://intra.brunel.ac.uk/chls/research/Pages/default.aspx</a></li> <li>• Debrief form- please ensure the dates on your debrief form are consistent with the approval dates.</li> <li>• Consent form - please add the college and department name to your heading.</li>  <li>• Please ensure the changes are completed before you start your study.</li> <li>• <b>Approval is given for remote (online/telephone) research activity only. Face-to-face activity and/or travel will require approval by way of an amendment.</b></li><li>• <b>The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.</b></li><li>• In addition to the above, please ensure that you monitor and adhere to all up-to-date local and national Government health advice for the duration of your project.</li></ul>	
<p><u>Please note that:</u></p> <ul style="list-style-type: none"><li>• Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.</li><li>• The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.</li><li>• The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.</li><li>• You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and</li></ul>	
<p style="text-align: center;">is a disciplinary offence.</p> <div style="text-align: center;"></div> <p style="text-align: center;">Professor Louise Mansfield Chair of the College of Health, Medicine and Life Sciences Research Ethics Committee (DLS) Brunel University London</p>	

## Appendix L: Invitation Ad UK

College of Health, Medicine and Life Sciences  
Department of Life Sciences



### INVITATION AD

Hello,

I am Rama Abu Hammour and I am now recruiting male and female participants for my PhD study. Please see the ad below for details.

#### Research Participation Invitation

Hello everyone!

We would like to learn more about eating patterns, for example:  
How often do you usually eat or drink certain foods?  
and How much do you usually eat or drink each time?  
What do you think about eating in moderation?

How can you help?

- Answer each question as best as you can
- Your perception and insight will provide valuable information to the study

Are you eligible?

- Aged 18 years or above

If you are interested in the study and willing to participate, please do click on the study link attached below. Furthermore, if you have any more questions, please do not hesitate to contact me, Rama Abu Hammour on [1832689@brunel.ac.uk](mailto:1832689@brunel.ac.uk). Thank you once again.

## Appendix M: Ethics UK



College of Health, Medicine and Life Sciences Research Ethics Committee (DLS)  
Brunel University London  
Kingston Lane  
Uxbridge  
UB8 3PH  
United Kingdom  
www.brunel.ac.uk

16 December 2022

### LETTER OF APPROVAL

APPROVAL HAS BEEN GRANTED FOR THIS STUDY TO BE CARRIED OUT BETWEEN 16/12/2022 AND 01/03/2023

Applicant (s): Mrs Rama Abu Hammour

Project Title: Socio-cognitive determinants of healthy eating habits in overweight and obese adults in several geographical locations.

Reference: 36810-MHR-Nov2022- 42171-2

Dear Mrs Rama Abu Hammour

The Research Ethics Committee has considered the above application recently submitted by you.

The Chair, acting under delegated authority has agreed that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that the conditions of approval set out below are followed:

- **The agreed protocol must be followed. Any changes to the protocol will require prior approval from the Committee by way of an application for an amendment.**
- **Please ensure that you monitor and adhere to all up-to-date local and national Government health advice for the duration of your project.**

#### Please note that:

- Research Participant Information Sheets and (where relevant) flyers, posters, and consent forms should include a clear statement that research ethics approval has been obtained from the relevant Research Ethics Committee.
- The Research Participant Information Sheets should include a clear statement that queries should be directed, in the first instance, to the Supervisor (where relevant), or the researcher. Complaints, on the other hand, should be directed, in the first instance, to the Chair of the relevant Research Ethics Committee.
- Approval to proceed with the study is granted subject to receipt by the Committee of satisfactory responses to any conditions that may appear above, in addition to any subsequent changes to the protocol.
- The Research Ethics Committee reserves the right to sample and review documentation, including raw data, relevant to the study.
- If your project has been approved to run for a duration longer than 12 months, you will be required to submit an annual progress report to the Research Ethics Committee. You will be contacted about submission of this report before it becomes due.
- You may not undertake any research activity if you are not a registered student of Brunel University or if you cease to become registered, including abeyance or temporary withdrawal. As a deregistered student you would not be insured to undertake research activity. Research activity includes the recruitment of participants, undertaking consent procedures and collection of data. Breach of this requirement constitutes research misconduct and is a disciplinary offence.

Professor Louise Mansfield

Chair of the College of Health, Medicine and Life Sciences Research Ethics Committee (DLS)

Brunel University London

## Appendix N: Consent UK



College of Health, Medicine and Life Sciences

Department of Life Sciences

### Online Consent Form

Socio-cognitive facilitators and barriers towards healthy eating in  
overweight and obese adults in several geographical areas

---

Please confirm the following:

	Yes	No
<ul style="list-style-type: none"><li>I have read the Participant Information Sheet included with this questionnaire</li></ul>		
<ul style="list-style-type: none"><li>I am over the age of 18</li></ul>		
<ul style="list-style-type: none"><li>I understand that no personal identifying data is collected in this study, therefore I know that once I have submitted my answers I am unable to withdraw my data from the study</li></ul>		
<ul style="list-style-type: none"><li>I agree that my data can be anonymised, stored and used in future research in line with Brunel University's data retention policies</li></ul>		
<ul style="list-style-type: none"><li>I agree to take part in this study</li></ul>		

College of Health, Medicine and Life Sciences

Department of Life Sciences



## Appendix O: PIS UK



College of Health, Medicine and Life Sciences

Department of Life Sciences

### Participant Information Sheet

#### Socio-cognitive facilitators and barriers towards healthy eating in overweight and obese adults in several geographical areas

You are being asked to take part in a research study. 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. Ask me 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 reading this.

What is the purpose of the study?

The purpose of this study is to identify the adults' beliefs regarding healthy eating habits in different geographical locations (United Kingdom and Jordan). We are also interested in if weight status and lifestyle have an impact on the

facilitators and barriers to healthy eating and whether these are similar or different across different geographical locations. We will be focusing on the term 'eating in moderation' and how people perceive it. We aim to explore the factors that might either play a role in helping or limiting healthy eating patterns. This information will be of importance so that researchers can

understand the differences between different countries/cultures in Europe and the Middle East. Furthermore, it will help future interventions to target the right beliefs in order to adopt healthier eating habits.

Why have I been invited to participate?

We are looking for individuals who fulfil the following criteria: Adults above the age of 18 years old- 60 years old, are willing to participate as demonstrated by the consent form.

Do I have to take part?

Your participation is entirely voluntary. However, please be aware that once you have submitted your final response, we will not be able to identify your data within the dataset, as it is automatically anonymised. The consequence of maintaining your anonymity is that you will not be able to withdraw your data once submitted.

What will happen to me if I take part?

Your participation will involve completing an online survey. The survey will consist of 90 questions. The survey will take no longer than 15 minutes to complete. The questionnaire will start off by asking some basic anonymous

demographic data: It will include your BMI, which country you currently live at, age and gender.

Please note that the type of information we are collecting does not include any personal information such as your name or specific address.

The second part of the questionnaire will include questions regarding your diet and eating in moderation specifically. The type of questions will focus on asking about the portions that you eat as well how often. This section will consist of 40 questions.

The third part of the questionnaire will include questions regarding your specific beliefs that you have towards eating in moderation. This section will consist of about 46 questions.

If you are happy to participate please click the link below (at the end of this document) to complete the survey.

Are there any lifestyle restrictions?

No, there are not any specific rules that must be taken into consideration before filling in the questionnaire.

What are the possible disadvantages and risks of taking part?

There are no anticipated disadvantages or risks associated with taking part in this study; however if you feel any discomfort due to the nature of some of the questions, please contact me or the rest of the research team if you have any concerns.

What if something goes wrong?

We do not anticipate in anything going wrong during the questionnaire; however, in the unlikely event of that happening, we will happily talk to you and direct you to the support that you need.

Alternatively, you can also contact the Research Ethics Committee, College of Health, Medicine and Life Sciences - Department of Life Sciences: DLS-Ethics@brunel.ac.uk.

Will my taking part in this study be kept confidential?

All collected data will be stored safely and securely in the Brunel university server. All participants' data will be treated confidentially. The study data will be completely anonymised. The data will not be used to identify any individual data at any time. For data analysis, only the anonymised data will be used by the researcher and can be used in future research.

How will the data be stored and retained?

The data will be stored in a secure electronic database in Brunel University London and will be retained up to ten years. After that period of time, the data will be safely destroyed and will no longer be used.

What will happen to the results of the research study?

The results of the study will form a part of my doctoral research thesis. The anonymised data will be used to generate results of this study and will be

reviewed academically by researchers at Brunel University. The results may also be presented at a conference and/or published in an academic journal.

Who is organising and funding the research?

The research has been organised by myself, Rama Abu Hammour in conjunction with Brunel University London.

What are the indemnity arrangements?

Brunel University London provides appropriate insurance cover for research which has received ethical approval.

Who has reviewed the study?

This research has been reviewed and approved by the College of Health, Medicine and Life Sciences Research Ethics Committee.

Brunel University London is committed to compliance with the Universities UK Research Integrity Concordat. You are entitled to expect the highest level of integrity from the researchers during the course of this research

Contact for further information and queries:

Researcher name and details:

Researcher: Rama Abu Hammour, 1832689@brunel.ac.uk

Gaskell Building

College of Health, Medicine and Life Sciences  
Brunel University London  
Kingston Lane  
Uxbridge UB8 3PH

Primary Supervisor name and details:


Dr Terry Dovey  
Head of Department- Psychology  
Gaskell Building 262  
College of Health, Medicine and Life Sciences - CHMLS  
Brunel University London  
Uxbridge UB8  
terry.dovey@brunel.ac.uk

Secondary Supervisor name and details:

Dr Kei Long Cheung  
Lecturer in Public Health  
Mary Seacole 201a  
College of Health, Medicine and Life Sciences - CHMLS  
Brunel University London  
Uxbridge UB8  
keilong.cheung@brunel.ac.uk

For complaints, Please contact the College of Health, Medicine and Life Sciences Research Ethics Committee Chair - Professor Louise Mansfield (Louise.Mansfield@brunel.ac.uk) Thank you very much for reading this document.

## Appendix P: Risk Assessment UK

Risk Assessment Form									
Socio-cognitive facilitators and barriers towards healthy eating in overweight and obese adults in several geographical areas									
This risk assessment should be <u>completed</u> for all research projects and should focus on any health and safety issues relating to Travel, Researchers or Participants.									
Socio-cognitive facilitators and barriers towards healthy eating in overweight and obese adults in several geographical areas									
Project Title		-----							
College/Directorate/Department		College of Health and Life Sciences- Department of Psychology							
Does your project involve travel (international or UK)?		NO (online study)							
Have you included measures relating to Covid-19 safety?		Not needed							
Date of initial assessment		30/11/2022							
<b>Brief description of work activity being assessed</b> Here you should briefly outline the type activity that will be occurring (travel, lab work, interviews of campus etc.).									
<i>At all times, you and your participants should follow <a href="#">the guidance on self-isolation</a> if they or anyone in their household shows coronavirus symptoms. Those who are self-isolating because they or somebody they live with has Coronavirus symptoms should do so in line with <a href="#">NHS guidance</a>. This is consistent with advice from the Chief Medical Officer.</i>									
<b>Things to consider within the assessment – this list may not be exhaustive</b>									
<ul style="list-style-type: none"> <li>• <b>Personal safety</b> e.g. Social distancing; Lone Working; Escape from fire; physical/verbal attack; disability or health problems; delayed access to personal or medical assistance; failure of routine or emergency communications; security of accommodation and support; getting lost, or stranded by transport; terrorism/kidnapping/civil unrest; cultural or legal differences. Please also consider any disposal of PPE. - List aspects of the work with significant hazards, and give brief details of how foreseeable harm/injuries could occur.</li> <li>• <b>Risk of distress, anxiety and psychological harm.</b></li> <li>• <b>Location/ Geographic risks</b> – Any risks specific to the proposed research location.</li> <li>• <b>Equipment hazards - Storage, handling and use of equipment and materials</b> e.g. Tools; machinery; vehicles; manual handling; noise; work at height; electricity; fire; vacuum; high pressure; high temperature; ultra violet; laser; vibration - List equipment and materials with significant hazards, and give brief details of how foreseeable harm/injuries could occur.</li> <li>• <b>Biological and or Chemical hazards that may be associated with your project:</b> Blood or blood products from humans or animals; <del>sterilisation</del> <u>sterilisation</u> or cleaning equipment and/or chemicals</li> </ul>									
<b>Risk Assessment:</b>									
Description of Hazard <small>(only include significant hazards inherent within the task or the activity. The list given below is not exhaustive and you should add appropriate rows for your work.)</small>	Person(s) at risk <small>e.g. staff, students, unexpected persons, etc.</small>	Current control measures in place	Current risk rating			Further control measures required and by whom and when <small>(usually only necessary where the risk rating is either high or medium)</small>	Final risk rating		
			Likelihood	Severity or Impact	Risk Rating		Likelihood	Severity or Impact	Risk Rating
Risk of distress, anxiety and psychological harm.	Participants	If the participants feel any psychological distress or anxiety during the questionnaire, they can skip those questions.  They can also contact myself or the research team members (contact info can be found on the PIS as well as Debrief forms)  There will also be websites linked in the Debrief form that will guide the participants to them and gain further insight <a href="#">to</a> potential solutions.	3 (Possible)	1 (Minor)	3 (LOW RISK)	x	x	x	x

Description of Hazard <small>(only include significant hazards inherent within the task or the activity. The list given below is not exhaustive and you should add appropriate rows for your work.)</small>	Person(s) at risk <small>e.g. staff, students, unexpected persons, etc.</small>	Current control measures in place	Current risk rating			Further control measures required and by whom and when <small>(usually only necessary where the risk rating is either high or medium)</small>	Final risk rating		
			Likelihood	Severity or Impact	Risk Rating		Likelihood	Severity or Impact	Risk Rating
Travel (Please indicate any travel related risks, but within the UK and Internationally)	x								
Covid secure measures (Please indicate the safety measures in place to reduce the likelihood of infection (researchers and participants))	x								
Lone Working	x								
Pre-existing medical conditions	x								
Laboratory or Workshop Hazards	x								
Physical	x								
Chemical	x								
Biological	x								

**Person(s) completing this assessment:**  
(Person carrying out or managing/supervising the activity day-to-day)

Name Rama Abu Hammour Title Doctoral Student Signature Rama Date 15/11/2022

**Other person(s) commenting on this assessment**  
(Line Manager or Supervisor responsible for the activity, others involved in the decision-making process)

Name Dr Terry Dovey Title Head of Department Signature \_\_\_\_\_ Date \_\_\_\_\_

**Person approving this assessment:**  
(Person with overall responsibility for the activity Director of Professional Service (or delegated individual, e.g. manager or head of department), Senior Academic or Manager/Supervisor)

Name \_\_\_\_\_ Title \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Review of assessment, and revision if necessary**  
(For continuing work: the assessment must be reviewed for each visit in a series; when there are significant changes to government guidance, to work materials, equipment, methods, location or people involved; and if there are accidents, near misses or complaints associated with the work. If none of these apply, the assessment must be reviewed at least annually)

REVIEW DATE	---	---	---	---
Name of reviewer				
Signature				
No revisions made				
Changes to activity, hazards, precautions or risks noted in text.				

**Appendix 1 – Risk Matrix**

The hazards identified within the risk assessment should be assigned a risk rating – this should be assigned for any control measures which are currently in place and any further control measures which will be required.

You should assign a value for the likelihood of an incident occurring based on the hazard from 1 to 5 and a value for the severity / impact of the hazard from 1 to 5. These should then be multiplied together to give a final risk rating e.g. 3 x 2 = 6.



SEVERITY OR IMPACT	5 CATASTROPHIC	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1 RARE	2 UNLIKELY	3 POSSIBLE	4 LIKELY	5 ALMOST CERTAIN
		LIKELIHOOD				

<p><b>The Risk Score</b> for a hazard causing harm is calculated as follows: <b>Likelihood x Severity or Impact</b></p>
<p><b>High - Rating 15 or more</b> Immediate action is required to control and/or lower the level of risk. Exposure to the identified hazard is prohibited or severely restricted</p>
<p><b>Medium - Rating 8 - 12</b> Urgent review of the equipment, activities, system of work within the workplace with the aim of lowering the risk to the next level.</p>
<p><b>Low - Rating 1 - 6</b> Usually, no further action will be required except for monitoring to ensure the risk does not change and controls remain in place. However, if it is possible to reduce the risk levels still further, by using</p>

#### Scoring Criteria

Severity or Impact	Criteria
5 Catastrophic	Death
4 Major	Multiple major injuries
3 Serious	Major injury
2 Moderate	Minor injury
1 Minor	Discomfort or minor illness

Likelihood	Criteria
5 Almost Certain	>80% (happens on a regular basis)
4 Likely	51-80% (has happened at least once in last year)
3 Possible	21-50% (has happened at least once in last 2 years)
2 Unlikely	6-20% (has happened once or twice in last 5 years)
1 Rare	0-5% (hasn't happened in last 5 years)

## Appendix Q: Debrief Form UK

College of Health, Medicine and Life Sciences  
Department of Life Sciences



### **Socio-cognitive facilitators and barriers towards healthy eating in overweight and obese adults in several geographical areas**

#### **Debrief form**

We would like to say thank you for taking the time to participate in our study.

The general purpose of this research is to try and understand what helps and limits people keeping to healthy eating habits and specifically eating in moderation. We are testing the application of the I-change model (<https://heindeevries.eu/interests/change>) in the context of healthy eating and whether it could be used to understand and provide the theoretical underpinnings to an effective intervention. Your contribution to the study will provide invaluable insight into healthy eating behaviour and provide intervention programs with valuable information to tackle major public health issues.

The results of the study will form a part of my doctoral research thesis. The anonymised data will be used to generate results of this study and will be reviewed academically by researchers at Brunel University.

Your participation is entirely voluntary. However, please be aware that once you have submitted your final response, we will not be able to identify your data within the dataset, as it is automatically anonymised. The consequence of maintaining your anonymity is that you will not be able to withdraw your data once submitted.

If you are interested in learning more information about healthy eating or if you have any concerns about your health, you may want to consult:

Your GP about any potential concerns you may have regarding your eating habits and how you could better them.

If you still feel like you have concerns, you could use this link to gain further insight to potential solutions.

If you live in the UK,

<https://www.gov.uk/government/publications/tackling-obesity-government-strategy/tackling-obesity-empowering-adults-and-children-to-live-healthier-lives>

If you live in Jordan: the Jordanian Ministry of health website for more.

<https://www.moh.gov.jo/Default/Ar>

If you were unduly or unexpectedly affected by taking part in the study, please feel free to skip the questions that make you feel distressed. Or contact the researcher and explain your concerns. If you feel unable for whatever reason to talk with the researcher then please either contact the researcher's principal supervisor Dr Terry Dovey [terry.dovey@brunel.ac.uk](mailto:terry.dovey@brunel.ac.uk) or one of the Division of Psychology Research ethics coordinators led by [Justin.OBrien@brunel.ac.uk](mailto:Justin.OBrien@brunel.ac.uk)

Once again, thank you for taking part in this research.

## Appendix R: Questionnaire - UK

College of Health, Medicine and Life Sciences  
Department of Life Sciences



### Socio-cognitive facilitators and barriers towards healthy eating in overweight and obese adults in several geographical areas

#### Questionnaire

Think about your usual eating pattern over the past month... PLEASE NOTE: For the following questions:

This photo may help you estimate how much you usually drink each time (ml)



1. Over the last month, on average, how often did you drink fruit juice (NOT 100% fruit juice)(eg. Caprisun, Fruitshoot, Tropicana )?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually drink each time?

\_\_\_ cup

OR

\_\_\_ ml

.....

2. Over the last month, on average, how often did you drink 100% fresh fruit JUICE (no added sugar)?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually drink each time?

\_\_\_ cup

OR

\_\_\_ ml

.....

3. Over the last month, on average, how often did you drink regular soft drink (eg. Coke, fanta)?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually drink each time?

\_\_\_ cup

OR

\_\_\_ ml

.....

4. Over the last month, on average, how often did you drink low-calorie/diet soft drink? (eg. Coke Zero, Diet lemonade) Or sugar-free energy drink (ie. Sugar-free V or sugar-free Red Bull)

Enter how many times: .....

☐ never (go to next question)

☐ per day

☐ per week

☐ per month

How much do you usually drink each time?

\_\_\_\_ cup

OR

\_\_\_\_ ml

.....

5. Over the last month, on average, how often did you drink regular energy drink (eg. V, Red Bull, Monster)

Enter how many times: .....

☐ never (go to next question)

☐ per day

☐ per week

☐ per month

How much do you usually drink each time?

\_\_\_\_ cup

OR

\_\_\_\_ ml

.....

6. Over the last month, on average, how often did you drink sports drink (eg. Gatorade, Powerade)

Enter how many times: .....

☐ never (go to next question)

☐ per day

☐ per week

☐ per month

How much do you usually drink each time?

\_\_\_\_ cup

OR

\_\_\_\_ ml

.....

7. Over the last month, on average, how often did you drink flavoured milk (eg. Yazoo, Alpro, Hersheys..)

Enter how many times: .....

☐ never (go to next question)

☐ per day

☐ per week

☐ per month

How much do you usually drink each time?

\_\_\_\_ cup

OR

\_\_\_\_ ml

.....

Think about your usual eating pattern over the past month... PLEASE NOTE: For the following questions:

This photo may help you estimate how much you usually eat each time



8. Over the last month, on average, how often did you add sugar or honey to your tea or coffee

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ teaspoon

\_\_\_\_ tablespoon

.....

9. Over the last month, on average, how often did you add sugar or honey to coffee, tea, hot chocolate or other drinks?

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ teaspoon

\_\_\_\_ tablespoon

.....

10. Over the last month, on average, how often did you add creamers, powdered drinking chocolate or other milk mix to your drink?

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month



How much do you usually add each time?

\_\_\_\_ teaspoon

\_\_\_\_ tablespoon

.....

11. Over the last month, on average, how often did you eat jam, honey, syrup, chutney or Nutella on bread/toast ?

☐ never (go to next question)

☐ per day

☐ per week

☐ per month

How much do you usually eat each time?

\_\_\_\_ teaspoon

\_\_\_\_ tablespoon

.....

12. Over the last month, on average, how often did you add tomato sauce (ketchup), BBQ or sweet chilli sauce to your foods?

never (go to next question)

☐ per day

☐ per week

☐ per month

How much do you usually eat each time?

\_\_\_\_ teaspoon

\_\_\_\_ tablespoon

\_\_\_\_ ml

.....

Think about your usual eating pattern over the past month...

HOW TO GAUGE HIGHLY-PROCESSED FOODS



13. Over the last month, on average, how often did you eat dried fruit (eg. raisins, prunes, dried apricots)?

never (go to next question)

- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_ cup

\_\_\_ handful

14. Over the last month, on average, how often did you eat canned fruit, stewed or baked fruit or frozen fruit?

never (go to next question)

- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_ cup

\_\_\_ can (425 grams)

15. Over the last month, on average, how often did you eat fresh raw fruit? (eg. apple, banana, orange, pear, grapes)

never (go to next question)

- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ whole piece of fruit

\_\_\_\_ handful

\_\_\_\_ cup

.....

16. Over the last month, on average, how often did you eat breakfast cereals?

never (go to next question)

- ☐ per day
- ☐ per week
- ☐ per month

Which type of cereal do you eat most often?

- ☐ Weetabix
- ☐ Coco pops
- ☐ Corn Flakes
- ☐ Rice Krispies
- ☐ All Bran Flakes
- ☐ Porridge (oatmeal)
- ☐ Other

How much do you usually eat each time?

\_\_\_\_ 1 scoop

\_\_\_\_ 2 scoops

\_\_\_\_ 3 scoops

-----

17. Over the last month, on average, how often did you add sugar, honey or sweet sauce (chocolate, strawberry) to other foods? (e.g. cereal, ice cream, pancakes)

never (go to next question)

- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually add each time?

\_\_\_\_ teaspoon

Or

\_\_\_\_ tablespoon

Or

\_\_\_\_ ml

-----

18. Over the last month, on average, how often did you eat muesli bars, cereal bars or nuts bars?

never (go to next question)

- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually add each time?

\_\_\_\_ bars

Or

\_\_\_\_ grams

-----

19. Over the last month, on average, how often did you eat chocolate biscuits (eg. ) or cream-filled sweet biscuits (e.g. cameo cream) never (go to next question)

- ☐ per day

- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ biscuit

Or

\_\_\_\_ pack (200 grams)

.....

20. Over the last month, on average, how often did you eat other sweet biscuits (eg. tea biscuits, gingernuts)?

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ biscuit

Or

\_\_\_\_ pack (200 grams)

.....

21. Over the last month, on average, how often did you eat sweet pastries or doughnuts?

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ number of doughnuts

\_\_\_\_ number of sweet pastries

.....

22. Over the last month, on average, how often did you eat cake, muffins?

☐ never (go to next question)

☐ per day

☐ per week

☐ per month

How much do you usually eat each time?

\_\_\_\_ cake slices

\_\_\_\_ number of muffins

.....

23. Over the last month, on average, how often did you eat Lollies (eg. Chuppachops, mints, toffee)

☐ never (go to next question)

☐ per day

☐ per week

☐ per month

How much do you usually eat each time?

\_\_\_\_ number of lollies

Or

\_\_\_\_ family pack (200 grams)

.....

24. Over the last month, on average, how often did you eat chocolate or chocolate bars (eg. Snickers, Crunchie, Flake, etc..)?

Enter how many times: .....

☐ never (go to next question)

☐ per day

- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ whole regular bar (45-50 grams)

Or

\_\_\_\_ whole large bar (200-350 grams)

Or

\_\_\_\_ squares

25. Over the last month, on average, how often do you eat ice cream, ice blocks, jelly or frozen yoghurt?

never (go to next question)

- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ 1 scoop

\_\_\_\_ 2 scoops

\_\_\_\_ 3 scoops

.....

26. Over the last month, on average, how often did you drink MILK or buttermilk

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually drink each time?

\_\_\_\_ cup

OR

\_\_\_\_ ml

.....

27. What kind of milk do you usually drink?

- ☐ Skimmed
  - ☐ Semi Skimmed
  - ☐ Full Fat
  - ☐ Non Dairy ( almond, coconut, etc.)
- .....

28. Over the last month, on average, how often did you eat yoghurt or fruity yoghurt?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ bowls

OR

\_\_\_\_ ml

OR

\_\_\_\_ cup

.....

29. What kind of yoghurt do you usually eat?

- ☐ Full Fat
  - ☐ Low fat/ reduced fat
  - ☐ Fat free
- .....



30. Over the last month, on average, How often did you eat bread?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ slices

Or

\_\_\_\_ whole pack

.....

31. Over the last month, on average, How often did you add butter/ margarine/ ghee spread on your bread?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually add each time?

\_\_\_\_ table spoon

Or

\_\_\_\_ teaspoon

32. What kind of butter/margarine spread do you usually use?

- ☐ Full Fat
- ☐ Low fat/ reduced fat
- ☐ Other butter substitutes ( eg. Avocado oil based, organic ghee, nut butter, etc.)

.....

33. Over the last month, on average, how often did you eat cheese?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ slices

.....

34. What kind of cheese do you usually eat?

- ☐ Full Fat
  - ☐ Low fat/ reduced fat
  - ☐ Fat free (non fat)
- .....

35. Over the last month, on average, how often did you eat meat? (eg. Beef, lamb, pork, chicken)

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

.....

36. Over the last month, on average, how often did you eat Cured meats ( smoked turkey deli, sandwich (deli) ham, cured cold meats, pâté, bacon (pork/beef))?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day

- ☐ per week
- ☐ per month

How much do you usually eat each time?

.....

37. Over the last month, on average, how often did you eat minced meat? (eg. Beef, lamb, pork)?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

.....

38. Over the last month, on average, how often did you add gravy to your meat?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually at each time?

\_\_\_ table spoon

Or

\_\_\_ teaspoon

39. Over the last month, on average, How often do you eat fried foods ( french fries, fried chicken, etc.)

Enter how many times: .....

- ☐ never (go to next question)

- ☐ per day
- ☐ per week
- ☐ per month

.....

40. Over the last month, on average, How often do you eat fried snacks in between meals ( potato chips/ crisps, beef/pork jerky, etc. )

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

.....

41. Over the last month, on average, How often do you eat snacks like nuts and peanuts in between meals?

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

How much do you usually eat each time?

\_\_\_\_ Handful

Or

\_\_\_\_ whole pack (200 grams)

.....

42. Over the last month, on average, How often do you eat ready to eat meals? (eg. ready made pizza, croquettes, instant soup..)

Enter how many times: .....

- ☐ never (go to next question)
- ☐ per day
- ☐ per week
- ☐ per month

### Questionnaire:

#### Part Two

For the next set of questions, answer with True/False:

#### Knowledge:

- 43. Eating in moderation means eating within your caloric limits
- 44. Eating in moderation means eating three meals a day
- 45. Eating in moderation means eating smaller portions
- 46. Eating in moderation means having only one high calorie snack a day
- 47. Eating in moderation means having a cheat day/meal and making up for it the next day/meal
- 48. Eating in moderation means consuming more protein and fewer carbohydrates
- 49. Eating in moderation means stop eating once you're full
- 50. Eating in moderation includes balanced macronutrients ( e.g. protein, fats, carbs)
- 51. Eating in moderation means having your last meal at least 2-3 hours before bedtime
- 52. Eating in moderation means reducing eating at restaurants / take out
- 53. switching white carbohydrates with brown/whole grain
- 54. reducing the amount of Red meat
- 55. means avoiding junk food
- 56. eating more home cooked meals
- 57. avoiding sugar
- 58. eating more dairy products (e.g. milk, yoghurt, cheese, etc.)
- 59. eating a low fat diet

For the next set of questions, answer with how likely you believe with the statements below on a scale of 1-7 :

**Risk perception:**

"I believe that:"

- 60. The risk of not eating in moderation will cause weight gain and obesity
- 61. The risk of not eating in moderation will cause physical health issues (e.g. diabetes, arthritis, etc.)
- 62. The risk of not eating in moderation will cause mental health issues ( stress, depression, irritability, etc.)
- 63. The risk of not eating in moderation will cause physical appearance concerns and low self-esteem
- 64. The risk of not eating in moderation will cause low levels of energy
- 65. The risk of not eating in moderation will cause sleep issues and breathing issues

**Attitude:**

"I believe that an advantage of eating in moderation is that:"

- 66. it will make me healthier and decrease my chances of getting diseases
- 67. it will result in a better physical appearance and a higher self esteem
- 68. it will result in mental health improvement and overall well being
- 69. it will make me lose weight/ maintain weight
- 70. it will result in more energy and will help me exercise more
- 71. it will set a good example for the rest of my family members
- 72. It will make me more socially approachable
- 73. it will eliminate the need to go on a diet
- 74. it will make me feel in control
- 75. it will save me money

Disadvantages: "If i eat in moderation.."

76. I will have to cut down on my social gatherings or completely avoid them (e.g. family celebrations, eating out with friends, etc.)
77. I will need to make more time to cook at home
78. I will not find healthy ingredients at my local supermarket
79. I will not like the taste of healthier food items / recipes
80. I will need to spend more money on healthier ingredients
81. I cannot order whatever I want at restaurants/ food delivery apps
82. I cannot eat late night dinners/ snacks

**Self-efficacy:**

83. I find eating in moderation to be difficult for me
84. I find eating in moderation challenging for me with the current knowledge I have
85. I find eating in moderation challenging for me during social gatherings

**Subjective norms:**

86. Most people who are important to me believe that eating in moderation is important

**Social Modelling:**

87. Most people who are important to me eat in moderation.

**Social support:**

88. Most people who are important to me encourage me to eat in moderation

**For the next set of questions, answer with True/False:**

**Action planning:**

**Intention:**

89. I intend on eating in moderation in the near future

**Preparatory and coping planning:**

90. I will join a monthly meal subscription plan

91. I will consult a nutritionist to aid me with meal planning

92. I will search for healthy recipes on the internet

93. I will use fitness accounts on social media (Instagram, Youtube) for inspiration

94. I will gradually cut out unhealthy items from my diet

95. I will cut out all unhealthy items at once

96. I will write a list of goals and reminders to keep me on track

97. I will ask for support from my family, friends, peers, etc.

98. I will join support groups and online forums (Facebook groups, Reddit, etc.)

99. I will join a gym

100. I will workout at home



## Appendix S: Questionnaire - Jordan



كلية الصحة والطب وعلوم الحياة

قسم علوم الحياة

العوامل الاجتماعية والإمراكية التي تساعد وتحيق تناول الطعام الصحي لدى البالغين الذين يعانون من زيادة الوزن والسمنة في العديد من المناطق الجغرافية

استبيان

فكر في نمط تناولك العادي للطعام على مدار الشهر الماضي.. يرجى الملاحظة: بالتسمية للأسئلة التالية:  
قد يساعدك هذا الصورة في تقدير كمية المشروبات التي تشربها عادة في كل مرة (مل)



1. خلال الشهر الماضي، ما متوسط عدد المرات التي شربت فيها عصير الفاكهة (ليس عصير الفاكهة الطبيعي 100٪):  
(مثل كابتري سن، فروت شوت، تروبيكانا)؟

أدخل عدد المرات.....:

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية العصير التي تشربها عادة في كل مرة؟

\_\_\_\_\_كوب

أو

\_\_\_\_\_مل

2. خلال الشهر الماضي، ما متوسط عدد المرات التي شربت فيها عصير الفاكهة الطازجة 100٪ (بدون إضافة السكر)؟

أدخل عدد المرات..... :

☐ أبدًا (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية العصير التي تشربها عادة في كل مرة؟

\_\_\_\_\_كوب

أو

\_\_\_\_\_مل

3. خلال الشهر الماضي، ما متوسط عدد المرات التي شربت فيها مشروبات غازية عادية (مثل كوك، فاندا)؟

أدخل عدد المرات..... :

☐ أبدًا (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية المشروبات الغازية التي تشربها عادة في كل مرة؟

\_\_\_\_\_كوب

أو

\_\_\_\_\_مل

4. خلال الشهر الماضي، ما متوسط عدد المرات التي شربت فيها مشروبات غازية قليلة السعرات الحرارية / داييت (مثل

كوك زيرو، ليموناد داييت) أو مشروبات طعنة خالية من السكر (مثل مشروب في الخالي من السكر أو ريد بل الخالي

من السكر)؟

أدخل عدد المرات..... :

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية المشروبات الخالية من السكر التي تشربها عادة في كل مرة؟

\_\_\_\_\_ كوب

أو

\_\_\_\_\_ مل

5. خلال الشهر الماضي، ما متوسط عدد المرات التي شربت فيها مشروب طاقة عادي (مثل في، ريد بُل، مونسو)؟

أدخل عدد المرات..... :

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية مشروبات الطاقة العادية التي تشربها عادة في كل مرة؟

\_\_\_\_\_ كوب

أو

\_\_\_\_\_ مل

6. خلال الشهر الماضي، ما متوسط عدد المرات التي شربت فيها مشروب رياضي (مثل جاكويرد، باوريد)؟

أدخل عدد المرات..... :

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية المشروب الرياضي التي تشربها عادة في كل مرة؟

كوب \_\_\_\_\_

أو

مل \_\_\_\_\_

7. خلال الشهر الماضي، ما متوسط عدد المرات التي شربت فيها حليبًا متغنيًا (مثل بازو، البرو، هيرشيز)؟  
أدخل عدد المرات: .....

☐ أبدًا (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

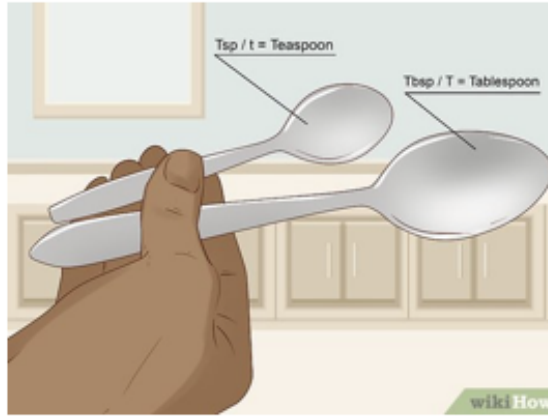
ما هي كمية الحليب التي تشربها عادة في كل مرة؟

كوب \_\_\_\_\_

أو

مل \_\_\_\_\_

فكر في تمط تناولك العادي للطعام على مدار الشهر الماضي... يرجى الملاحظة: بالتسمية للأسئلة التالية:  
قد تساعدك هذا الصورة في تقدير كمية الطعام التي تتناولها عادة في كل مرة



8. خلال الشهر الماضي، ما متوسط عدد المرات التي أضفت فيها السكر أو العسل إلى الشاي أو القهوة التي تشربها؟

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية السكر أو العسل الذي تصيفه عادة في كل مرة؟

\_\_\_\_\_ملعقة صغيرة

\_\_\_\_\_ملعقة كبيرة

9. خلال الشهر الماضي، ما متوسط عدد المرات التي أضفت فيها السكر أو العسل إلى القهوة، الشاي، الشوكولا الساخنة أو المشروبات الأخرى؟

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية السكر أو العسل الذي تصيفه عادة في كل مرة؟

\_\_\_\_\_ملعقة صغيرة

\_\_\_\_\_ملعقة كبيرة

10. خلال الشهر الماضي، ما متوسط عدد المرات التي أضفت فيها المبيضات، الشوكولا المجففة للشرب أو خلطات الحليب الأخرى إلى مشروبك؟

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية المبيضات أو بودرة الشوكولا المجففة أو خلطة الحليب الأخرى التي تصيفها عادة في كل مرة؟

ملعقة صغيرة \_\_\_\_\_

ملعقة كبيرة \_\_\_\_\_

11. خلال الشهر الماضي، ما متوسط عدد المرات التي أكلت المربي، العسل، الشراب، الشاي أو النوتيلا على الخبز /

التوست؟

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

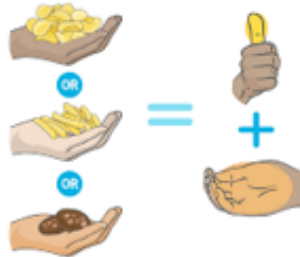
كمية المربي، أو العسل، أو الشراب، أو الشاي، أو النوتيلا التي تأكلها عادة في كل مرة؟

ملعقة صغيرة \_\_\_\_\_

ملعقة كبيرة \_\_\_\_\_

12. خلال الشهر الماضي، ما متوسط عدد المرات التي أضفت فيها صلصة الطماطم (كاتشب)، صلصة الباريكيو أو

#### HOW TO GAUGE HIGHLY-PROCESSED FOODS



صلصة الفلفل الحلو إلى طعامك؟

أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

□ في الشهر

كمية الصلصة التي تتناولها عادة في كل مرة؟

\_\_\_\_\_ملعقة صغيرة

\_\_\_\_\_ملعقة كبيرة

\_\_\_\_\_مل

فكر في تمط تناولك العادي للطعام على مدار الشهر الماضي

13. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها الفواكه المجففة (مثل الزبيب، اليراقوق المجفف،

الشمش المجفف)؟

أبدأ (انتقل إلى السؤال التالي)

□ في اليوم

□ في الأسبوع

□ في الشهر

كمية الفاكهة المجففة التي تأكلها عادة في كل مرة؟

\_\_\_\_\_كوب

\_\_\_\_\_حفنة

14. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها الفواكه المعلبة، والفواكه المطهوه أو المخبوزة، أو

الفواكه المجمدة؟

أبدأ (انتقل إلى السؤال التالي)

□ في اليوم

□ في الأسبوع

□ في الشهر

كمية الفاكهة التي تتناولها عادة في كل مرة؟

\_\_\_\_\_كوب

\_\_\_\_\_علبة (425 جرام)

15. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها الفواكه الطازجة النيئة؟ (مثل التفاح، الموز، البرتقال،

الإجاص، العنب)

أبدأ (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية الفاكهة التي تأكلها عادة في كل مرة؟

\_\_\_\_\_ قطعة كاملة من الفاكهة

\_\_\_\_\_ حفنة

\_\_\_\_\_ كوب

16. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها حبوب الإفطار؟

أبدأ (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

أي نوع من حبوب الإفطار تتناوله أكثر؟

☐ وينديكس

☐ كوكو بوبس

☐ كورن فليكس

☐ رايس كريسييز

☐ أول بران فليكس

☐ العصيدة (الشوفان)

☐ أنواع أخرى

ما هي كمية حبوب الإفطار التي تتناولها عادة في كل مرة؟

\_\_\_\_\_ مغرفة واحدة

\_\_\_\_\_ مغرقتان

\_\_\_\_\_ ثلاث مغارف



17. خلال الشهر الماضي، ما متوسط عدد المرات التي أضفت فيها السكر، العسل أو صلصة حلوه (شوكولا، فراولة) إلى

أطعمه أخرى؟ (مثل حبوب الإفطار، المثلجات، فطائر البان كيك)

أبدأ (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية السكر، أو العسل، أو الصلصة الحلوه التي تصيفها عادة في كل مرة؟

ملعقة صغيرة

أو

ملعقة كبيرة

أو

مل

18. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها ألواح الموصلي، أو ألواح الحبوب، أو ألواح المكسرات؟

أبدأ (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية الألواح التي تناولها عادة في كل مرة؟

لوح

أو

جرام

19. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها بسكويت الشوكولا (مثل ...) أو بسكويت الحلو المحشوة

بالكريمة (مثل كاميو كريم)؟

أبدأ (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية البسكويت التي تأكلها عادة في كل مرة؟

\_\_\_\_\_ قطع من البسكويت  
أو

\_\_\_\_\_ عبوة (200 جرام)

.....

20. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها بسكويت حلو آخر (مثل بسكويت الشاي، بسكويت الزنجبيل)؟

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية البسكويت التي تأكلها عادة في كل مرة؟

\_\_\_\_\_ قطعة بسكويت

أو

\_\_\_\_\_ عبوة (200 جرام)

.....

21. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها المعجنات الحلوة أو الدونات؟

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية المعجنات التي تأكلها عادة في كل مرة؟

\_\_\_\_\_ عدد الدونات

\_\_\_\_\_ عدد المعجنات الحلوة

.....

22. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها الكعك أو المافن؟

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية الكيك أو المافن التي تناولتها عادة في كل مرة؟

شريحة كيك \_\_\_\_\_

عدد المافن \_\_\_\_\_

23. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها حلوى المصاصات (مثل شوبا شوبس ، النعناع،

التوفي)؟

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية حلوى المصاصات التي تأكلها عادة في كل مرة؟

عدد حلوى المصاصات \_\_\_\_\_

أو

عبوة عائلية (200 جرام) \_\_\_\_\_

24. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها الشوكولا أو ألواح الشوكولا (مثل سنبرز، كراشي،

فليك، إلخ)؟

أدخل عدد المرات..... :

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية الشوكولا التي تناولتها عادة في كل مرة؟

لوح شوكولا كامل عادي (45-50 جرام) \_\_\_\_\_

أو

\_\_\_\_\_ لوح شوكولا كامل بحجم كبير (200-350 جرام)

أو

\_\_\_\_\_ مربعات

25. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها المتلجات، أو قطع المتلجات، أو الجيلي، أو اللين

الزبادي المجمد؟

أبدأ (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية المتلجات التي تناولها عادة في كل مرة؟

\_\_\_\_\_ مغرفة واحدة

\_\_\_\_\_ مغرتان

\_\_\_\_\_ ثلاث مغارف

26. خلال الشهر الماضي، ما متوسط عدد المرات التي شربت فيها الحليب أو اللين الزبادي؟

أدخل عدد المرات: .....

أبدأ (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية الحليب أو اللين الزبادي التي تشربها عادة في كل مرة؟

\_\_\_\_\_ كوب

أو

\_\_\_\_\_ مل

27. ما نوع الحليب الذي تشربه عادة؟

☐ قليل الدسم

☐ شبه قليل الدسم

☐ كامل الدسم

☐ غير الألبان (لوز، جوز الهند، إلخ)

28. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها اللبن الزبادي أو الزبادي مع الفواكه؟

أدخل عدد المرات..... :

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية اللبن الزبادي التي تأكلها عادة في كل مرة؟

\_\_\_\_\_ وعاء

أو

\_\_\_\_\_ مل

أو

\_\_\_\_\_ كوب

29. أي نوع من الزبادي تتناوله عادة؟

☐ كامل الدسم

☐ قليل الدسم / مخفص الدسم

☐ خالي من الدهون

30. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها الخبز؟

أدخل عدد المرات..... :

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية الخبز التي تأكلها عادة في كل مرة؟

\_\_\_\_ شرائح الخبز

أو

\_\_\_\_ صوبه كامله

31. خلال الشهر الماضي، ما متوسط عدد المرات التي أحضرت فيها زبد / سمن نباتي / سمن حيواني على خبزك؟

أدخل عدد المرات..... :

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية الزبد والسمن بأنواعه التي تصيفها عادة في كل مرة؟

\_\_\_\_ ملعقة طعام كبيره

أو

\_\_\_\_ ملعقة صغيره

32. أي نوع من الزبد / السمن النباتي تستخدمه عادة؟

☐ كامل الدسم

☐ قليل الدسم / مخفض الدسم

☐ بديل آخرى للزبد (مثل زيت الأفوكادو، السمن الحيواني العضوي، زبد المكسرات، إلخ)

33. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها الجبن؟

أدخل عدد المرات..... :

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما هي كمية الجبن التي تتناولها عادة في كل مرة؟

\_\_\_\_ شرائح الجبن

34. ما نوع الجبن الذي تتناوله عادة؟

- ☐ كامل الدسم
- ☐ قليل الدسم / مخفص الدسم
- ☐ خالي من الدهون (غير دسم)
- .....

35. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها اللحم؟ (مثل لحم البقر، لحم الضأن، لحم الخنزير، الدجاج)

أدخل عدد المرات..... :

☐ أبدًا (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

كمية ما تأكله عادة في كل مرة؟

.....

36. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها اللحم المعالجة (لحم الدك التركي الدبلي المنخن، ساندويش

لحم الخنزير (دبلي)، اللحم الباردة المعالجة، بانيه، لحم الخنزير المقدد (خنزير/ بقر)؟

أدخل عدد المرات..... :

☐ أبدًا (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما كمية ما تأكله عادة في كل مرة؟

.....

37. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها اللحم المفروم؟ (مثل لحم البقر، لحم الخروف، لحم

الخنزير)؟

أدخل عدد المرات..... :

☐ أبدًا (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما كمية اللحم التي تأكلها عادة في كل مرة؟

.....

38. خلال الشهر الماضي، ما متوسط عدد المرات التي أضفت فيها الصلصة إلى اللحم؟

أدخل عدد المرات: .....

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

.....

39. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها الأطعمة المقلية (بطاطا مقلية، دجاج مقلي، إلخ)

أدخل عدد المرات: .....

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

.....

40. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها وجبات خفيفة مقلية بين الوجبات (الشيس /رفائق البطاطس،

لحم البقر/لحم الخنزير المقدد، إلخ)

أدخل عدد المرات: .....

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

.....

41. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها وجبات خفيفة مثل المكسرات والفول السوداني بين

الوجبات؟

أدخل عدد المرات: .....



☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

ما كمية ما تأكله عادة في كل مرة؟

\_\_\_\_\_ حفنة

أو

\_\_\_\_\_ العبوة بأكملها (200 جرام)

42. خلال الشهر الماضي، ما متوسط عدد المرات التي تناولت فيها وجبات أكل جاهزة؟

(مثل بيتزا جاهزة، الكروكيت، حساء فوري، إلخ)

أدخل عدد المرات: .....

☐ أبداً (انتقل إلى السؤال التالي)

☐ في اليوم

☐ في الأسبوع

☐ في الشهر

استبيان :

الجزء الثاني:

لأسئلة التالية، الرجاء الإجابة بصح/خطأ:

المعرفة

43. الأكل بشكل معتدل يعني تناول الطعام ضمن حدود السرعات الحرارية المحددة لك.

44. الأكل بشكل معتدل يعني تناول ثلاث وجبات في اليوم.

45. الأكل بشكل معتدل يعني تناول حصص أصغر.

46. الأكل بشكل معتدل يعني تناول وجبة خفيفة واحدة عالية السرعات الحرارية فقط في اليوم.

47. الأكل بشكل معتدل يعني الحصول على يوم مفتوح/وجبة خاصة وموحيص ذلك في اليوم/الوجبة التالية.

48. الأكل بشكل معتدل يعني تناول مزيد من البروتين وكمية أقل من الكربوهيدرات.

49. الأكل بشكل معتدل يعني التوقف عن تناول الطعام عندما تشعر بالشبع.

50. الأكل بشكل معتدل يشمل توازن العناصر الغذائية الرئيسية (مثل البروتين، والدهون، والكربوهيدرات).

51. الأكل بشكل معتدل يعني تناول وجبتك الأخيرة قبل النوم بمدة تتراوح بين 2-3 ساعات.
52. الأكل بشكل معتدل يعني الحد من تناول الطعام في المطاعم أو الحد من الأكل الخارجي.
53. استبدال الكربوهيدرات البيضاء بالكربوهيدرات الكاملة البنية/ الحبوب الكاملة.
54. تقليل كمية اللحوم الحمراء.
55. تجنب تناول الوجبات السريعة.
56. تناول المزيد من الوجبات المنزلية في المنزل.
57. تجنب تناول السكر.
58. تناول المزيد من منتجات الألبان (مثل الحليب والزبادي والجبن، إلخ).
59. اتباع نظام غذائي قليل الدهون.

لأسئلة التالية، يرجى الإجابة على مدى اعتقادك بصحة العبارات التالية على مقياس من 1 إلى 7:

#### تصور المخاطر

الموقف:

"أعتقد أن:"

60. خطر عدم تناول الطعام بشكل معتدل سيؤدي إلى زيادة الوزن والسمنة.
61. خطر عدم تناول الطعام بشكل معتدل سيؤدي إلى مشاكل صحية جسدية (مثل السكري، التهاب المفاصل، وغيرها).
62. خطر عدم تناول الطعام بشكل معتدل سيؤدي إلى مشاكل صحية عقلية (التوتر، الاكتئاب، العصبية، إلخ).
63. خطر عدم تناول الطعام بشكل معتدل سيؤدي إلى القلق على المظهر الجسدي وانخفاض تقدير الذات.
64. خطر عدم تناول الطعام بشكل معتدل سيؤدي إلى انخفاض مستويات الطاقة.
65. خطر عدم تناول الطعام بشكل معتدل سيؤدي إلى مشاكل في النوم والتنفس.

الموقف:

"أعتقد أن ميزات تناول الطعام بشكل معتدل هي أنها سيؤدي إلى:"

66. سيجعلني أكثر صحة ويقلل من فرص الإصابة بالأمراض.
67. سيؤدي إلى مظهر جسدي أفضل وثقة أعلى بالنفس.
68. سيؤدي إلى تحسين الصحة العقلية والصحة العامة.
69. سيجعلني أقتد وزناً / أحافظ على وزني.
70. سيؤدي إلى زيادة الطاقة وسيساعدني على ممارسة المزيد من التمارين الرياضية.
71. سيجعلني كنوة جيدة لبقية أفراد عائلتي.

72. سيجعلني أكثر تواصلاً اجتماعياً.

73. سيلغي حاجتي لاتباع نظام غذائي.

74. سيجعلني أشعر بالسيطرة.

75. سيوفر لي المال.

سليكات التغذية المعتدلة: "إلا أكلت باعتدال" ..

76. سأضطر إلى تقليل التجمعات الاجتماعية أو تجنبها تمامًا (مثل الاحتفالات العائلية، تناول الطعام بالخارج مع أصدقائي، إلخ).

77. سأحتاج إلى تخصيص المزيد من الوقت للطهي في المنزل.

78. لن أجد مكونات صحية في السوبر ماركت المحلي.

79. لن أحب طعم المواد الغذائية / الوصفات الصحية.

80. سأحتاج إلى إنفاق المزيد من المال على المكونات الصحية.

81. لا أتمكن من طلب ما أريد في المطاعم/تطبيقات توصيل الطعام.

82. لن أتمكن من تناول وجبات العشاء/الوجبات الخفيفة في وقت متأخر من الليل.

القدرة الذاتية على السيطرة على النفس:

83. أجد أن تناول الطعام باعتدال أمر صعب بالنسبة لي.

المعايير الشخصية:

84. يعتقد معظم الأشخاص المهمين بالنسبة لي أن تناول الطعام باعتدال أمر مهم.

85. لدى معظم الأشخاص المهمين بالنسبة لي آراء متباينة بشأن تناول الطعام باعتدال.

القدرة الاجتماعية:

86. معظم الأشخاص المهمين بالنسبة لي يأكلون باعتدال.

الدعم الاجتماعي:

87. معظم الأشخاص المهمين بالنسبة لي يشجعوني على تناول الطعام باعتدال.

88. معظم الأشخاص المهمين بالنسبة لي لن يدعموا قرارني بتناول الطعام باعتدال.

بالنسبة للمجموعة التالية من الأسئلة، أجب بصح/خطأ:

**التخطيط للعمل:**

**نتيجة:**

89. أئوي تناول الطعام باعتدال في المستقبل القريب

**التخطيط التحضيري والتخطيط للتعامل:**

90. سألتزم إلى خطة اشترك شهرية للوجبات.

91. سأستشير أخصائي تغذية لمساعدتي في تخطيط الوجبات.

92. سأبحث عن وصفات صحية على الإنترنت.

93. سأستخدم حسابات للياقة البدنية على وسائل التواصل الاجتماعي (إنستغرام، يوتيوب) للحصول على الإلهام.

94. سأخلص تدريجيًا من العناصر غير الصحية في نظام غذائي.

95. سأخلص من جميع العناصر غير الصحية دفعة واحدة.

مرحباً،

أنا راما أبو حمور وأقوم الآن بتوظيف المشاركين من الذكور والإناث في دراسة الدكتوراه. يرجى الاطلاع على الإعلان أدناه للحصول على التفاصيل. سوف تتلقى 10 جنيهات مقابل وقتك. يرجى الاتصال إذا كنت ترغب في المشاركة أو إذا كان لديك أي أسئلة. يمكنك إرسال رسالة على Facebook أو مراسلتي عبر البريد الإلكتروني على [brunel.ac.uk@1832689](mailto:brunel.ac.uk@1832689)

### دعوة للمشاركة في البحث

"الميسرات الاجتماعية والمعرفية والعوائق التي تحول دون تناول الطعام الصحي لدى البالغين الذين يعانون من زيادة الوزن والسمنة في عدة مناطق جغرافية"

هناك حاجة لمتطوعين من الذكور والإناث تبلغ أعمارهم 18 عامًا أو أكثر للمشاركة في دراسة تبحث في فهمنا لسلوكيات الأكل الصحية لدى الأشخاص ، وخاصة البالغين الذين يعانون من زيادة الوزن والسمنة ، وكيف تحفز العوامل المختلفة أو تحد منها. يجري هذا البحث من قبل طالبة الدكتوراه (راما أبو حمور) بصفتها الباحث الرئيسي تحت إشراف الدكتور تيري دوفي والدكتور كي

سيحصل المشاركون على 10 جنيهات كتعويض عن وقتهم.

"مرحباً بالجميع ، هل تساءلت يوماً عن العوامل التي تؤثر على سلوكيات الأكل الصحي لديك؟ أجري مقابلات كجزء من دراستي البحثية لنيل درجة الدكتوراه لتحسين فهمنا لسلوكيات الأكل الصحية لدى الناس ، وخاصة البالغين الذين يعانون من زيادة الوزن والسمنة ، وكيف تحفز العوامل المختلفة أو تحد منها. سيوفر إدراكك ورؤيتك معلومات قيمة للدراسة. أنا راما أبو حمور ، مروج صحة عامة وباحثة دكتوراه ستقود هذا البحث في جامعة Brunel ، لندن."

ستستغرق المقابلة في المتوسط 45 دقيقة إلى ساعة واحدة. ستكون المقابلة ودية وغير رسمية. سيحدث إما على برنامج zoom أو Skype. سيتم تسجيل ردودك على الأسئلة بالصوت باستخدام برنامج قضاة وتبقى سرية ومجهولة الهوية.

## Appendix U: Consent – Jordan



نموذج الموافقة عبر الإنترنت

يرجى تأكيد ما يلي:

نعم / لا

• لقد قرأت ورقة معلومات المشارك المضمنة في هذا الاستبيان

• عمري يزيد عن 18 عامًا  
• أفهم أنه لا يتم جمع أي بيانات تعريف شخصية في هذه الدراسة ، لذلك أعلم أنه بمجرد تقديم إجاباتي ، لا يمكنني سحب بياناتي من الدراسة

• أوافق على إمكانية إخفاء هوية بياناتي وتخزينها واستخدامها في البحث المستقبلي بما يتماشى مع سياسات الاحتفاظ بالبيانات في جامعة Brunel

• أوافق على المشاركة في هذه الدراسة

مؤشر الأكل الصحي القصير

Q1

(فاكهة)

في المتوسط ، كم عدد حصص الفاكهة (باستثناء العصير) التي تتناولها يوميًا؟  
مثال: حصة واحدة من الفاكهة =  $2/1$  كوب من الفاكهة المقطعة ، أو  $2/1$  موزة ، أو قطعة واحدة صغيرة من الفاكهة الكاملة (تفاح ، برتقال ، كمثرى ، إلخ). قطعة واحدة صغيرة من الفاكهة الكاملة بحجم كرة البيسبول .  
 $2/1$  كوب فاكهة مقطعة بحجم فأرة الكمبيوتر.

(1) أقل من 1

(2) 1

(3) 2

(4) 3

(5) 4

(6) 5

(7) 6 أو أكثر

(8) اختر عدم الإجابة

Q2 (عصير فواكه)

في المتوسط ، كم عدد حصص عصير الفاكهة 100% التي تشربها يوميًا؟  
ملاحظة: لا تقم بتضمين المشروبات بنكهة الفاكهة مثل Hi-C و Tang و Sunny-D وما إلى ذلك.

مثال: حصة واحدة من العصير =  $2/1$  كوب عصير فواكه 100% (تفاح ، عنب ، برتقال ، إلخ) ، كوب عصير = علبة عصير.

(1) أقل من 1



- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- 6 أو أكثر (7)
- (8) اختر عدم الإجابة

### Q3

(نباتي)

الآن ، فكر في كل الخضروات التي تتناولها في اليوم .

في المتوسط ، كم عدد حصص الخضروات التي تتناولها يوميًا؟

ملحوظة : أي خضروات أو عصير خضروات 100% يعتبر عضوًا في مجموعة الخضار .

مثال: حصة واحدة = 1 كوب من الخضار النيئة

، 1 كوب من السلطة ، 2/1 كوب من الخضار

المطبوخة ، أو 2/1 كوب من عصير الخضار 100% .

كوب واحد من الخضار النيئة بحجم كرة

البسبوس . 2/1 كوب من الخضار المطبوخة هو

حجم فأرة الكمبيوتر .

(1) أقل من 1

1 (2)

2 (3)

3 (4)

4 (5)

5 (6)

- (7) 6 أو أكثر  
(8) اختر عدم الإجابة

Q4 الآن ، فكر في الخضروات الخضراء التي تتناولها في يوم واحد فقط مثل السبانخ ، والفاصوليا الخضراء ، واللفت ، والبروكلي ، والكوسا ، أو غيرها من الخضروات الخضراء في الغالب.

في المتوسط ، كم عدد حصص الخضروات الخضراء التي تتناولها يوميًا؟  
ملاحظة: لا تشمل الخضار النشوية مثل البازلاء الخضراء.

مثال: حصة واحدة = 1 كوب من الخضار النيئة أو 2/1 كوب من الخضار المطبوخة. 1 كوب من الخضار النيئة بحجم كرة البيسبول. 2/1 كوب من الخضار المطبوخة هو حجم فأرة الكمبيوتر.

- (1) أقل من 1  
(2) 1  
(3) 2  
(4) 3  
(5) 4  
(6) 5  
(7) 6 أو أكثر  
(8) اختر عدم الإجابة

Q5 (نشوي)

الآن ، فكر فقط في الخضار النشوية التي  
تتناولها في يوم واحد مثل الذرة أو البازلاء  
الخضراء أو البطاطس.  
في المتوسط ، كم عدد حصص الخضروات النشوية  
التي تتناولها يوميًا؟  
أمثلة: حصة واحدة = 1 كوب من الخضار النيئة  
أو 2/1 كوب من الخضار المطبوخة. 1 كوب من  
الخضار النيئة بحجم فأس الكمبيوتر.

(1) أقل من 1

(2) 1

(3) 2

(4) 3

(5) 4

(6) 5

(7) 6 أو أكثر

(8) اختر عدم الإجابة

Q6

في المتوسط ، كم عدد حصص الحبوب التي  
تتناولها يوميًا؟  
أمثلة: حصة واحدة = شريحة خبز واحدة ؛ 2/1  
كوب فريك ، 1 كوب من الحبوب الجاهزة للأكل ،

2/1 كوب دقيق الشوفان ، 1 تورتilla صغير ، 2/1  
كوب أرز مطبوخ ، أو 2/1 كوب معكرونة. 1 كوب  
من الحبوب الجاهزة للأكل بحجم كرة البيسبول.

- (1) أقل من 1
- (2) 1
- (3) 2
- (4) 3
- (5) 4
- (6) 5
- (7) 6 أو أكثر
- (8) اختر عدم الإجابة

Q7 (الحبوب 2) إذا تم تحديد "أقل من 1" لـ  
Q6

في المتوسط ، كم مرة تأكل الحبوب؟  
أمثلة: حصة واحدة = شريحة خبز واحدة ؛ 2/1  
كوب فريك ، 1 كوب من الحبوب الجاهزة للأكل ،  
2/1 كوب دقيق الشوفان ، 1 تورتilla صغير ، 2/1  
كوب أرز مطبوخ ، أو 2/1 كوب معكرونة.

- (1) عدة مرات في الأسبوع
- (2) عدة مرات في الشهر
- (3) بضع مرات في السنة
- (4) تقريبا أبدا
- (5) أبدا

(6) اختر عدم الإجابة  
Q8 (الحبوب الكاملة)

الآن ، فكر فقط في الحبوب الكاملة التي  
تتناولها مثل خبز القمح الكامل ، أو  
مقرمشات الحبوب الكاملة ، أو الأرز البني ،  
أو دقيق الشوفان .

في المتوسط ، كم عدد حصص الحبوب الكاملة  
التي تتناولها يوميًا؟

أمثلة: حصة واحدة = شريحة واحدة من خبز  
القمح الكامل ، أو 5-6 من المقرمشات  
المصنوعة من الحبوب الكاملة ، أو 3 أكواب  
من الفشار ، أو نصف كوب من الأرز البني  
المطبوخ ، أو نصف كوب من دقيق الشوفان .

(1) أقل من 1

(2) 1

(3) 2

(4) 3

(5) 4

(6) 5

(7) 6 أو أكثر

(8) اختر عدم الإجابة

في المتوسط ، ما مقدار السكر المضاف الذي  
تستهلكه يوميًا؟

ملاحظة: غالبًا ما توجد السكريات المضافة في  
الأطعمة مثل الخبز أو الكعك أو الحلوى أو  
الشاي الحلو أو المربى أو الآيس كريم أو  
السكر المضاف إلى الطعام على المائدة . لا  
تقم بتضمين السكريات الطبيعية مثل اللاكتوز  
في الحليب أو الفركتوز في الفاكهة .

أمثلة: السكر الأبيض ، السكر البني ، السكر  
الخام ، شراب الذرة ، المواد الصلبة لشراب  
الذرة ، شراب الذرة عالي الفركتوز ، شراب  
الشعير ، شراب القيقب ، شراب الفطائر ،  
مُحلي الفركتوز ، الفركتوز السائل ، العسل ،  
دبس السكر ، وسكر العنب.

(1) لا شيء / لا شيء تقريبًا

(2) بعض

(3) الكثير

(4) اختر عدم الإجابة

Q21 (سقطت)

كم عدد حصص الدهون المشبعة التي تستهلكها  
في المتوسط يوميًا؟

ملحوظة: يجب اعتبار الدهون المشبعة لهذه  
الأغراض دهون صلبة. الدهون الصلبة هي دهون  
صلبة في درجة حرارة الغرفة.

أمثلة: الزبدة ، الكعك ، البسكويت ، كريسكو  
، زيت جوز الهند ، دهن البقر (الشحم ،  
الشحم) ، دهن الدجاج (شحم الخنزير) ، السمن  
النباتي ، والسمن.

(1) لا شيء / لا شيء تقريبًا

(2) بعض

(3) الكثير

(4) اختر عدم الإجابة

Q22 (ماء)

في المتوسط ، ما مقدار الماء الذي تشربه  
يوميًا؟

(1) لا شيء / لا شيء تقريبًا

(2) بعض

(3) الكثير

(4) اختر عدم الإجابة

في المتوسط ، ما مقدار السكر المضاف الذي تستهلكه يوميًا؟  
ملاحظة: غالبًا ما توجد السكريات المضافة في الأطعمة مثل الخبز أو الكعك أو الحلوى أو الشاي الحلو أو المربى أو الآيس كريم أو السكر المضاف إلى الطعام على المائدة. لا تقم بتضمين السكريات الطبيعية مثل اللاكتوز في الحليب أو الفركتوز في الفاكهة.  
أمثلة: السكر الأبيض ، السكر البني ، السكر الخام ، شراب الذرة ، المواد الصلبة لشراب الذرة ، شراب الذرة عالي الفركتوز ، شراب الشعير ، شراب القيقب ، شراب القطائر ، مُحلي الفركتوز ، الفركتوز السائل ، العسل ، دبس السكر ، وسكر العنب.

(1) لا شيء / لا شيء تقريبًا

(2) بعض

(3) الكثير

(4) اختر عدم الإجابة

Q21 (سقطت)

كم عدد حصص الدهون المشبعة التي تستهلكها في المتوسط يوميًا؟  
ملحوظة: يجب اعتبار الدهون المشبعة لهذه الأغراض دهون صلبة. الدهون الصلبة هي دهون صلبة في درجة حرارة الغرفة.  
أمثلة: الزبدة ، الكعك ، البسكويت ، كريسكو ، زيت جوز الهند ، دهن البقر (الشحم ،

الشحم) ، دهن الدجاج (شحم الخنزير) ، السمن  
النباتي ، والسمن.

(1) لا شيء / لا شيء تقريباً

(2) بعض

(3) الكثير

(4) اختر عدم الإجابة

Q22 (ماء)

في المتوسط ، ما مقدار الماء الذي تشربه  
يوميًا؟

(1) لا شيء / لا شيء تقريباً

(2) بعض

(3) الكثير

(4) اختر عدم الإجابة



## Appendix V: PIS - Jordan



College of Health, Medicine and Life Sciences

Department of Life Sciences

### ورقة معلومات المشارك

الميسرات الاجتماعية والمعرفية والعوائق التي تحول دون تناول الطعام الصحي لدى البالغين الذين يعانون من زيادة الوزن والسمنة في عدة مناطق جغرافية

يُطلب منك المشاركة في دراسة بحثية. قبل أن تقرر ، من المهم أن تفهم سبب إجراء البحث وما الذي سيتضمنه. يرجى تخصيص بعض الوقت لقراءة المعلومات التالية بعناية ومناقشتها مع الآخرين إذا كنت ترغب في ذلك. اسألني إذا كان هناك أي شيء غير واضح أو إذا كنت ترغب في مزيد من المعلومات. خذ وقتك لتقرر ما إذا كنت ترغب في المشاركة أم لا. شكرًا لقراءتك هذا.

ما هو الغرض من الدراسة؟

الغرض من هذه الدراسة هو استكشاف المعتقدات الاجتماعية المعرفية لدى البالغين الذين يعانون من زيادة الوزن والسمنة تجاه سلوكياتهم الغذائية الصحية. باستخدام النماذج النفسية ، سوف نستكشف العوامل التي قد تسهل أو تحد من أنماط الأكل الصحي. ستساعد نتائج هذه الدراسة أيضًا في تزويد الاستبيانات والمراحل التالية من دراستنا بالمعلومات.

لماذا تمت دعوتي للمشاركة؟

بعد مشاهدة الإعلان على المجموعة ، قررت المشاركة في دراستنا وكنت مؤهلاً للقيام بذلك بناءً على معايير الاختيار لدينا: متطوعون أو إناث يبلغون من العمر 18 عامًا أو أكثر ولديهم مؤشر كتلة الجسم 25 كجم / م<sup>2</sup> أو أعلى .

هل يجب علي المشاركة؟  
مشاركتم طوعية تماما. علاوة على ذلك ، في الحالة التي قررت فيها المشاركة في الدراسة ثم غيرت رأيك ، فلا يزال بإمكانك الانسحاب دون تقديم سبب حتى يتم نشر ورقة الأطروحة.

ماذا سيحدث لي إذا شاركت؟  
بعد قراءة هذه المعلومات ، سيُطلب منك إكمال نموذج الموافقة. إذا كنت على استعداد للمشاركة ، فسنختار بعد ذلك التاريخ والوقت المناسبين لك للقاء عبر Zoom / Skype أو أي برنامج عبر الإنترنت تفضله.  
سنكون المقابلة ودية وغير رسمية. نحن مهتمون بالتعرف على تجاربك في حياتك وكيف تشعر حيال نظامك الغذائي وما تأكله ، وكم تأكل ومدى صحة عاداتك الغذائية. ستتمتع بحرية المناقشة وإعطاء إجاباتك كيفما قررت ذلك.  
بمجرد الانتهاء من المقابلة ، ستتاح لك الفرصة لطرح أي أسئلة قد تكون لديك حول الدراسة. ستحصل أيضًا على تفاصيل الاتصال بفريق البحث قبل المغادرة. سيتم تحليل إجاباتك على الأسئلة جنبًا إلى جنب مع المشاركين الآخرين لإنشاء موضوعات من شأنها أن تساعد في إرشاد الدراسات المستقبلية في الدكتوراه الخاصة بي لاستكشاف تغيير السلوك الغذائي. يمكن استخدام الاقتباسات من مقابلاتك في الأطروحة أو نشرها في مجلة أكاديمية.

هل هناك أي قيود على نمط الحياة؟  
لا ، لا توجد قواعد محددة يجب أخذها بعين الاعتبار قبل المقابلة.

ما هي العيوب والمخاطر المحتملة للمشاركة؟

لا توجد عيوب أو مخاطر متوقعة مرتبطة بالمشاركة في هذه الدراسة.  
ومع ذلك ، إذا شعرت بأي إزعاج بعد المقابلة ، يمكنك الاتصال بي أو الاتصال  
ببقية فريق البحث إذا كانت لديك أية مخاوف.

ما هي فوائد ممكنة من المشاركة؟

ستوفر نتائج المقابلة نظرة ثاقبة مفيدة وتضع الأساس لأسئلة الأسئلة التي سيتم  
تشكيلها للمرحلة التالية من بحثنا.

كتعويض عن وقتك ، ستحصل على 10 جنيهات إذا قررت المشاركة في  
الدراسة.

ماذا لو حدث خطأ ما؟

لا نتوقع حدوث أي خطأ أثناء المقابلة ؛ ومع ذلك ، في حالة حدوث ذلك غير  
المحتمل ، سوف نتحدث معك بسعادة ونوجهك إلى الدعم الذي تحتاجه.  
بدلاً من ذلك ، يمكنك أيضاً الاتصال بلجنة أخلاقيات البحث ، كلية الصحة ،  
الطب وعلوم الحياة - قسم علوم الحياة: -DLS  
Ethics@brunel.ac.uk

هل ستبقى مشاركتي في هذه الدراسة سرية؟

سيتم تخزين جميع البيانات التي تم جمعها بأمان وأمان في خادم جامعة  
Brunel. سيتم التعامل مع جميع بيانات المشاركين بشكل سري. سيتم إخفاء  
هوية بيانات الدراسة وترميزها فور جمعها. لن يتم استخدام البيانات لتحديد أي  
بيانات فردية في أي وقت. علاوة على ذلك ، لن يتم الكشف عن هويات  
المشاركين لأي طرف ثالث. سيتم تخزين وثائق الترميز المرتبطة بشكل منفصل  
للحفاظ على حق المشاركين في المشاركة. لتحليل البيانات ، سيتم استخدام  
البيانات مجهولة المصدر فقط من قبل الباحث ويمكن استخدامها في البحث  
المستقبلي.

هل سأُسجَل وكيف سيتم استخدام التسجيل؟  
سيتم تسجيل جميع المقابلات بالصوت باستخدام برنامج Otter. سيتم بعد ذلك نسخ التسجيلات وترميزها. سيتم بعد ذلك حذف التسجيلات الصوتية ولن يتم نشر أي بيانات فردية ولن يتم التعرف عليك بأي شكل من الأشكال من هذه النصوص.

ماذا سيحدث لنتائج الدراسة البحثية؟  
ستشكل نتائج الدراسة جزءاً من أطروحة بحث الدكتوراه الخاصة بي. سيتم استخدام البيانات مجهولة المصدر لتوليد نتائج هذه الدراسة وستتم مراجعتها أكاديمياً من قبل الباحثين في جامعة برونيل. يمكن أيضاً تقديم النتائج في مؤتمر و / أو نشرها في مجلة أكاديمية. علاوة على ذلك ، يمكن مشاركة نص المقابلة مع باحثين آخرين لاستخدامه في الأبحاث المستقبلية.

من يقوم بتنظيم وتمويل البحث؟  
تم تنظيم البحث وتمويله من قبل الباحث وكذلك جامعة برونيل.

ما هي ترتيبات التعويض؟  
توفر جامعة برونيل لندن تغطية تأمينية مناسبة للأبحاث التي حصلت على الموافقة الأخلاقية.

من قيم هذه الدراسة؟  
تمت مراجعة هذا البحث واعتماده من قبل لجنة أخلاقيات البحث في كلية الصحة والطب وعلوم الحياة.  
نزاهة البحث  
تلتزم جامعة برونيل بلندن بالامتثال لاتفاق النزاهة البحثية للجامعات البريطانية.  
يحق لك توقع أعلى مستوى من النزاهة من الباحثين عن إعادة البحث أثناء إجراء هذا البحث  
اتصل لمزيد من المعلومات والاستفسارات

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اسم وتفاصيل المشرف الثانوي:  
الدكتور كي لونج تشيونغ  
محاضر في الصحة العامة  
ماري سيكول 201 أ  
كلية الصحة والطب وعلوم الحياة - CHMLS  
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للكاوي رئيس لجنة أخلاقيات البحث:

البروفيسور كريستينا فيكتور ، رئيس لجنة أخلاقيات أبحاث كلية الصحة والطب  
وعلم الحيا

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شكرا جزيلا لقراءة هذه الوثيقة لك.

## Appendix W: Risk Assessment – Jordan

### نموذج تقييم المخاطر

#### Socio-cognitive facilitators and barriers towards healthy eating in overweight and obese adults in several geographical areas

#### نموذج تقييم المخاطر

الميسرات والمعوقات الاجتماعية والمعرفية تجاه الأكل الصحي لدى البالغين الذين يعانون من زيادة الوزن والسمنة في مناطق جغرافية مختلفة  
يجب استكمال هذا التقييم للمخاطر لجميع المشاريع البحثية وينبغي التركيز على أي قضايا صحية أو سلامة تتعلق بالسفر أو الباحثين أو المشاركين.

عنوان المشروع	الميسرات والمعوقات الاجتماعية والمعرفية تجاه الأكل الصحي لدى البالغين الذين يعانون من زيادة الوزن والسمنة في مناطق جغرافية مختلفة
الكلية/الإدارة/القسم	كلية الصحة وعلوم الحياة - قسم علم النفس
هل يتضمن مشروعك السفر (دولياً أو داخل المملكة المتحدة)؟	لا (الدراسة عبر الإنترنت)
هل قمت بتضمين التدابير المتعلقة بسلامة كوفيد-19؟	غير مطلوب
تاريخ التقييم الأولي	30/11/2022

في جميع الأوقات، يجب عليك وعلى المشاركين الالتزام بإرشادات العزل الذاتي إذا ظهرت أعراض فيروس كورونا عليهم أو على أي شخص في أسرهم. يجب على الأشخاص الذين يعزلون أنفسهم بسبب إصابتهم أو إصابة أحد أفراد أسرهم بأعراض (NHS) فيروس كورونا القيام بذلك وفقاً لإرشادات هيئة الصحة الوطنية. أمور يجب أخذها بعين الاعتبار في التقييم - هذه القائمة قد لا تكون شاملة

#### أمور يجب أخذها بعين الاعتبار ضمن التقييم - قد لا تكون هذه القائمة شاملة

- السلامة الشخصية: مثل التباعد الاجتماعي؛ العمل الفردي؛ الهروب من الحرائق؛ الهجمات البدنية/اللفظية؛ الإعاقة أو المشاكل الصحية؛ تأخير الوصول إلى المساعدة الشخصية أو الطبية؛ فشل الاتصالات الروتينية أو الطارئة؛ أمن الإقامة والدعم؛ الضياع أو الوقوع في مأزق أثناء النقل؛ الإرهاب/الاختطاف/الاضطرابات المدنية؛ الاختلافات الثقافية أو القانونية. يُرجى أيضاً مراعاة أي التخلّص من معدات الوقاية الشخصية. قم بإدراج جوانب العمل التي تنطوي على مخاطر كبيرة، وقم بتقديم تفاصيل موجزة عن كيفية حدوث - الأضرار/الإصابات المتوقعة.
- مخاطر التوتر أو القلق أو الأذى النفسي.
- المخاطر الجغرافية/الموقعية - أي مخاطر خاصة بموقع البحث المقترح.
- مخاطر المعدات - التخزين، المناولة، واستخدام المعدات والمواد مثل الأدوات؛ الآلات الكبيرة؛ المركبات؛ المناولة اليدوية؛ الضوضاء؛ العمل على ارتفاعات؛ الكهرباء؛ الحرائق؛ التفريغ الهوائي؛ الضغط العالي؛ درجات الحرارة العالية؛ الأشعة فوق البنفسجية؛ الليزر؛ الاهتزاز - قم بإدراج المعدات والمواد التي تنطوي على مخاطر كبيرة، وقم بتفاصيل موجزة عن كيفية حدوث الأضرار/الإصابات المتوقعة.
- المخاطر البيولوجية أو الكيميائية التي قد ترتبط بمشروعك: دم أو منتجات دموية من البشر أو الحيوانات؛ التعقيم أو تنظيف المعدات و/أو المواد الكيميائية.

## تقييم المخاطر:

وصف الخطر	الأشخاص المعرضون للخطر	الإجراءات الحالية للتحكم	التقييم النهائي إجراءات إضافية		
			التقييم الحالي للمخاطر	للتحكم	للمخاطر
المشاركين خطر التوتر أو القلق أو الأذى النفسي		إذا شعر المشاركون بأي توتر نفسي أو قلق أثناء الإجابة ،على الاستبيان، يمكنهم تخطي هذه الأسئلة (ونموذج الإنهاء	3 (ممكن) 1 (طفيف) 3 (مخاطر) (منخفضة)	X	X
X السفر (يرجى الإشارة إلى أي مخاطر متعلقة بالسفر داخل المملكة المتحدة أو دولياً)		لا ينطبق	X	X	X
الأمان المتعلق بكوفيد	X	لا ينطبق	X	X	X

وصف الخطر	الأشخاص المعرضون للخطر	الإجراءات الحالية للتحكم	التقييم النهائي إجراءات إضافية		
			التقييم الحالي للمخاطر	للتحكم	للمخاطر
المشاركين خطر التوتر أو القلق أو الأذى النفسي		إذا شعر المشاركون بأي توتر نفسي أو قلق أثناء الإجابة ،على الاستبيان، يمكنهم تخطي هذه الأسئلة (ونموذج الإنهاء	3 (ممكن) 1 (طفيف) 3 (مخاطر) (منخفضة)	X	X
X السفر (يرجى الإشارة إلى أي مخاطر متعلقة بالسفر داخل المملكة المتحدة أو دولياً)		لا ينطبق	X	X	X
الأمان المتعلق بكوفيد	X	لا ينطبق	X	X	X



**الأشخاص الذين أكملوا هذا التقييم**

الشخص الذي يقوم بإجراء التقييم أو الإشراف على النشاط اليومي

الاسم: راما أبو حمور

اللقب: طالبة دكتوراه

التوقيع: راما

التاريخ: 15/11/2022

أشخاص آخرون يعلقون على هذا التقييم

الاسم: د. نيري دوفي

اللقب: رئيس القسم

التوقيع:

التاريخ:

الشخص الذي يوافق على هذا التقييم

الاسم:

اللقب:

التوقيع:

التاريخ:

SEVERITY or IMPACT	5 CATASTROPHIC	5	10	15	20	25	<p><b>The Risk Score</b> for a hazard causing harm is calculated as follows: <b>Likelihood x Severity or Impact</b></p> <p><b>High - Rating 15 or more</b> Immediate action is required to control and/or lower the level of risk. Exposure to the identified hazard is prohibited or severely restricted</p> <p><b>Medium - Rating 8 - 12</b> Urgent review of the equipment, activities, system of work within the workplace with the aim of lowering the risk to the next level.</p> <p><b>Low - Rating 1 – 6</b> Usually, no further action will be required except for monitoring to ensure the risk does not change and controls remain in place.</p>
	4 MAJOR	4	8	12	16	20	
	3 SERIOUS	3	6	9	12	15	
	2 MODERATE	2	4	6	8	10	
	1 MINOR	1	2	3	4	5	
		1 RARE	2 UNLIKELY	3 POSSIBLE	4 LIKELY	5 ALMOST CERTAIN	
		LIKELIHOOD					

#### مراجعة التقييم وإجراء التعديلات إذا لزم الأمر:

بالنسبة للعمل المستمر، يجب مراجعة التقييم لكل زيارة ضمن سلسلة؛ عند حدوث تغييرات كبيرة في توجيهات الحكومة، أو المواد، أو المعدات، أو الطرق، أو الموقع، أو الأشخاص المعنيين؛ أو عند وقوع حوادث، أو أخطاء، أو شكاوى متعلقة بالعمل. إذا لم ينطبق أي مما سبق، يجب مراجعة التقييم مرة واحدة على الأقل سنوياً. لا توجد تعديلات التوقيع اسم المراجع تاريخ المراجعة  
لا توجد تعديلات  
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#### الملحق 1 - مصفوفة المخاطر

يجب تخصيص تقييم للمخاطر المحددة في التقييم للمخاطر - هذا التقييم يجب أن يتم بناءً على أي تدابير تحكم موجودة حالياً وأي تدابير تحكم أخرى ستكون مطلوبة.

يجب تخصيص قيمة لاحتمالية وقوع الحادث بناءً على الخطر من 1 إلى 5 وقيمة لشدة تأثير الخطر من 1 إلى 6. يجب ضرب هذه القيم للحصول على تصنيف نهائي للمخاطر. مثال:  $3 \times 2 = 6$ .  
(شبه مؤكد) 5 (مرجح) 4 (ممكن) 3 (غير محتمل) 2 (نادر) 1 احتمالية

## Appendix X: Debrief - Jordan

College of Health, Medicine and Life Sciences  
Department of Life Sciences



### Socio-cognitive facilitators and barriers towards healthy eating in overweight and obese adults in several geographical areas

"الميسرات الاجتماعية والمعرفية والعوائق التي تحول دون تناول الطعام الصحي لدى البالغين الذين يعانون من زيادة الوزن والسمنة في عدة مناطق جغرافية"

The College of Health, Medicine and Life Sciences Research Ethics Committee has granted approval FOR THIS STUDY TO BE CARRIED OUT BETWEEN 10/3/2021 until 10/8/2021

#### استمارة استخلاص المعلومات

نود أن نشكرك على الوقت الذي قضيته في المشاركة في مقابلتنا .

الغرض العام من هذا البحث هو محاولة فهم المعتقدات الاجتماعية المعرفية التي قد تكون لدى الناس عندما يتعلق الأمر بعبادات الأكل الصحية وخاصة تناول الطعام باعتدال .

قد تكون هذه المعتقدات الاجتماعية المعرفية إما ميسرة أو حواجز نحو الأكل الصحي وتناول الطعام باعتدال .

ستوفر مساهمتك في الدراسة رؤى ونتائج مفيدة وتضع الأساس للاستبيانات التي سيتم تشكيلها للمرحلة التالية من بحثنا .

ستشكل نتائج الدراسة جزءاً من أطروحة بحث الدكتوراه الخاصة بي. سيتم تخزين جميع البيانات التي تم جمعها بأمان وأمان في خادم الجامعة. سيتم استخدام البيانات مجهولة المصدر لتوليد نتائج هذه الدراسة وسيتم مراجعتها أكاديمياً من قبل الباحثين في جامعة برونييل. لن يتم نشر أي بيانات فردية ، ولن يتم التعرف عليك بأي شكل من الأشكال من هذه النصوص. سيتم تنقيح أي معلومات يمكن أن تحدد هويتك.

لك مطلق الحرية في سحب بياناتك من البحث في أي وقت عن طريق الاتصال بالباحث  
brunel.ac.uk@1832689 أو مشرفي الدكتور تيري  
دوفي  
terry.dovey@brunel.ac.uk .

إذا كنت قد تأثرت بشكل غير ملائم أو غير متوقع بالمشاركة في الدراسة ، فلا تتردد في إعادتها إلى الباحث. إذا كنت تشعر بعدم القدرة على التحدث مع الباحث لأي سبب من الأسباب ، فيرجى إما الاتصال بمشرفي الدكتور تيري دوفي terry.dovey@brunel.ac.uk أو أحد منسقي أخلاقيات قسم أبحاث علم النفس بقيادة

Justin.OBrien@brunel.ac . المملكة المتحدة أو  
.266367 01895

بدلاً من ذلك ، يمكنك الاتصال بطبيبك العام  
بشأن مخاوفك أو الاتصال بمنظمة الحياة  
الأسرية لطلب النصيحة.

يمكنك أيضًا الاتصال بمراقبي الوزن  
<https://www.weightwatchers.com/us> / إذا كانت لديك  
أي مخاوف أخرى.

وكذلك موقع الحكومة البريطانية للمزيد.  
[https://www.gov.uk/government/publications/tackling-  
obesity-government-strategy/tackling-obesity-empowering-  
adults-and-children-to-live-healthier-lives](https://www.gov.uk/government/publications/tackling-obesity-government-strategy/tackling-obesity-empowering-adults-and-children-to-live-healthier-lives)

مرة أخرى ، شكرًا لك على المشاركة في هذا  
البحث