The evaluation of a brief online Cognitive Behavioural Therapy informed group for Maladaptive Eating Patterns in a preoperative bariatric surgery sample: A mixed-methods study

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Preface

"Usually when we hear or read something new, we just compare it to our own ideas. If it is the same, we accept it and say that it is correct. If it is not, we say it is incorrect. In either case, we learn nothing."

Thich Nhat Hanh, The Heart of the Buddha's Teaching: Transforming Suffering into Peace, Joy, and Liberation

Introduction

Over the course of the Professional Doctorate in Counselling Psychology training, I have had the opportunity to acquire clinical and research skills and develop my reflective scientist-practitioner identity. This doctoral portfolio is the culmination of my learning thus far and the foundation I intend to continue building. As I come to the end of my training, I remain reflective of how my journey as a professional is just beginning. I am grateful to have been given the privilege of higher education and will continue developing my clinical skills, knowledge, and research abilities to help create a better world.

This portfolio has three components that reflect the skills and training gained over the past three years: Part A- an empirical research project, Part B- a client case study and Part C- a publishable journal article. These parts are weaved together by the tension sitting at the core of the Counselling Psychology profession, that of holding multiple views and learning to honour differences. My journey with my own weight biases, triggered in part by my work with Lily (Part B; all names and identifying information has been anonymised to maintain confidentiality), led me to discover a weight inclusive approach to health, which whilst fitted with my values raised questions regarding my role as an applied psychologist working on a bariatric pathway. The research (Part A) and the journal article (Part C) have been heavily influenced by my personal and professional journey with my weight biases. Both parts highlight the importance of equity and ethics in the care being provided to individuals living in larger bodies in the UK.

Part A: Research Project

The empirical research project investigated the effectiveness of a brief online CBT-informed intervention for maladaptive eating on a sample of bariatric surgery candidates in the UK. A concurrent triangulation mixed-methods design was employed. The quantitative strand of the evaluation consisted of a series of standardised questionnaires investigating eating patterns and wellbeing, being administered to participants receiving the intervention via an online survey software at three timepoints: psychological assessment, pre- and post-intervention. The final quantitative sample consisted of 44 candidates for bariatric surgery. The quantitative

data was analysed to detect changes within-group across the three timepoints. A doubly multivariate MANOVA was conducted on the omnibus variable Maladaptive Eating Patterns. Furthermore, Analyses of Variance (ANOVAs) were conducted to investigate changes across timepoints at the level of each variable to assess whether the intervention improved participants eating patterns and wellbeing. Friedman's tests were conducted for variables that did not meet normality criteria to explore changes across timepoints. The qualitative strand consisted of capturing participants experiences of the group intervention both in an open-ended feedback questionnaire and by conducting semi-structured interviews following their attendance of the group intervention. An overall, 40 participants completed the feedback questionnaire, and four participants consented to participate in the semi-structured interview. The qualitative data was analysed using thematic analysis to consider the acceptability of the intervention, enhance understanding of the quantitative results, identify primary mechanisms of action and areas of improvement of the group intervention. The study concluded that the group intervention significantly contributed to improving participants eating patterns and wellbeing. The study's findings are discussed in the context of relevant literature, together with its strengths, limitations, and implications for clinical and research practice.

Part B: Client case study

Having worked and researched primarily in the National Health Service (NHS) before entering the professional doctorate, I understood the tensions of working with time-limited and protocol-based approaches. I had mainly practised informed by cognitive-behavioural (ACT, CFT, MBCT) and systemic approaches across my NHS placements. While I enjoyed these experiences, I was often left frustrated by the limitations that steamed from lack of resources and economic drive for cost-effectiveness in mental health. This experience inspired me to seek a placement in private practice where I could develop my skills in providing longer-term interventions that are integrative and tailored to the client's needs. It is here that I had the privilege to meet Lily, who first came to the service due to her struggles with procrastination. In the context of a worldwide pandemic, Lily further disclosed her struggles with weight and her strained relationship with food. In making sense of her life difficulties, we chose to work in a pluralistic way to empower Lily to shape the course of therapy and increase her sense of agency. Throughout the stages of our work together, I learned about the deleterious impact that weight stigma has had on Lily's wellbeing. Drawing on my systemic skills, I informed the formulation and intervention by recognising how the *fatist* societal context was a maintaining factor in Lily's presentation. This work was fundamental in helping me appreciate the power of pluralism in the facilitation of change. It was an opportunity to further explore the power of Schema Therapy in piecing life difficulties together in a coherent narrative. The clinical case

additionally brings to the front the tension between honouring the choice and agency of clients whilst remaining informed by the evidence-based in providing therapeutic interventions.

My pluralistic work with Lily allowed me to reflect on the importance of respecting the choices and different viewpoints that our clients and colleagues in the wider multidisciplinary team may hold. It allowed me to reflect on and grapple with the difficulty of working in a service dedicated to 'shrinking bodies' that does not always align with my activist/feminist identity. This struggle informed a new understanding of my role in bariatric pathways as a person and a professional that radically supports informed choice and agency. My professional growth mirrored Lily's personal growth.

Section C: Publishable Journal Article

The journal article summarises the findings of the empirical research study conducted (Part A), highlighting the impact the brief online group intervention had on the maladaptive eating patterns and wellbeing of candidates to bariatric surgery. Whilst not all hypotheses were confirmed by the results, it is essential to publish such findings to avoid publication bias and perhaps highlight the pandemic's impact on participants eating patterns. Given the overall positive preliminary findings, it is hoped that researchers can use these results to further inform the development of the intervention or other such interventions for candidates to bariatric surgery. In choosing a publication, several aspects were considered, and Appetite journal was selected as it has been noted to publish similar studies and has a high impact factor (3.86). Hopefully, the publication will inspire other applied psychologists to conduct studies on the good services they deliver in bariatric pathways in the UK and thus help build the evidence-based for this client population.

PART A: Doctoral research

The evaluation of a brief online Cognitive Behavioural Therapy informed group for Maladaptive Eating Patterns in a preoperative bariatric surgery sample:

A mixed-methods study

Supervisor

Dr Jessica Jones Nielsen

Abstract

Maladaptive eating patterns (MEPs) are a treatment-limiting factor for most individuals seeking bariatric surgery due to prior research linking them to poorer surgery outcomes (NICE, 2014). To date, there is only a small, heterogeneous body of literature in preoperative psychological interventions targeting MEPs that has rendered mixed findings, leading some researchers to conclude that the best timing for such interventions is post-surgery. Nonetheless, given the documented higher prevalence of MEPs in the pre-bariatric population, individuals may require additional psychological support to qualify for surgery, particularly in the UK. Therefore, there is a need for developing evidence-based interventions targeting MEPs for this under-researched population.

A mixed-methods study was conducted, aiming at evaluating an online four-week CBT-informed group intervention for MEPs. Forty-four pre-bariatric candidates presenting with MEPs attended the group intervention. Data on MEPs and Wellbeing (mood, anxiety, quality of life) was collected at: psychological assessment, pre- and post-group intervention timepoints. Semi-structured interviews were conducted alongside feedback questionnaires at post-intervention timepoint.

Results indicated significant improvements in participants' levels of BE and UE at post-intervention timepoint only ($p<.01$), with significant differences being found across all timepoints for EE ($p<.01$). No differences were observed in Cognitive Restraint ($p=.37$). Furthermore, significant improvements in Wellbeing were observed at post-intervention timepoint only ($p< .01$). Participants reported that the intervention was helpful and informative, highlighting various useful behaviour change mechanisms. They suggested a more balanced/flexible coverage of MEPs and an increase in the number of sessions to allow for more interaction time and consolidation of skills. Overall findings suggest the intervention was successful in improving participants' MEPs and Wellbeing.

Abbreviations

ANOVA	Analyses of Variance
BED	Binge Eating Disorder
BMI	Body Mass Index
CR	Cognitive Restraint
EE	Emotional Eating
MANOVA	Multivariate Analysis of Variance
MEPs	Maladaptive Eating Patterns
UE	Uncontrolled Eating

Chapter 1: Introduction

1.1 Obesity narratives

The label of obesity has a long and contentious history (Cooper, 1998), with the dominant biomedical view being that obesity poses a high health risk. This perspective has led to adoption of a weight normative approach within the public healthcare systems, that emphasises weight and weight-loss when defining health and wellbeing (Tylka et al., 2014). Within the last 30 years, this weight normative approach to health has declared a *war on fat*, which inadvertently contributed to increased weight stigma and the oppression of larger bodies within society (Cooper, 2016). In the context of the COVID-19 pandemic, weight stigma has become more prevalent and apparent in our society despite overwhelming evidence showing its detrimental impact on weight gain, physical and mental health (Puhl et al., 2020b). The following paragraphs will present a critical perspective on the weight normative narrative, aligned with the weight inclusive approach to health, which emphasises a multifaceted view of health and wellbeing independent of weight. This latter approach assumes that everyone can achieve both health and wellbeing when they have access to non-stigmatising health care (Tylka et al., 2014; Bacon, 2010). Whilst not denying the impact that weight can have on health at either extreme of the spectrum (< 18 and > 40 Body Mass Index; BMI), the Introduction chapter aims at bringing a more nuanced perspective around the topic of obesity.

Labels can be stigmatising, and this makes language around weight important. Whilst the study uses the term obesity for academic purposes and consensus, this is inherently medical terminology that many people find stigmatising. Hence people first language will be adopted when referring to individuals. In addition, there is no universally accepted term for people at a higher weight, with some activists reclaiming the word *fat* (Gordon, 2020; Cooper, 1996) whilst others still find this an offensive word, particularly in healthcare conversations (Puhl et al., 2020a). Thus, a more neutral terminology has been selected and used throughout this study, with terms such as *overweight* and *obese* being replaced by *individuals living in larger bodies* and/or *people at a higher weight.*

1.2 Definition and measurement

Obesity has been defined as an excessive/abnormal body fat accumulation that may compromise an individual's health (World Health Organisation: WHO, 2021; Royal College of Physicians, 2015). The BMI is the most widely employed measure of obesity and is defined by a person's weight in kilograms divided by their height in square meters (kg/m^2; WHO, 2021). Currently, adults are considered overweight if their BMI is greater than or equal to $25kg/m^2$, obese if their BMI is greater than or equal to $30kg/m^2$ and morbidly obese if their BMI is greater

or equal to 40kg/m^2. Although it is recognised that BMI is a rough measure and varies across gender, ethnicity, and age, it is still widely used to classify obesity amongst individuals. This is due to previous studies having found BMI to correlate with body fat mass and an increased risk of mortality and adverse health outcomes (WHO, 2021; Guh et al., 2009a; Dixon, 2010).

1.3 BMI history

The BMI was introduced by Flemish statistician Lambert Adolph Jacque Quatelet and was then known as the Quatelet Index (Nutall, 2015). Dr Quatelet was interested in 'social averages' and wanted to determine the characteristics of an 'average' person and their distribution. It is noteworthy that Dr Quatelet did not believe the BMI should be used as a measure/indicator of fat or health. Keys and colleagues adopted the Quatelet Index for their research in 1972 and renamed it BMI. However, it was only in the early 1990s that the BMI was recognised by WHO that assembled an Expert Consultation Group which established four categories: underweight (BMI<18), normal weight (BMI between 18.5 and 24.9), overweight (BMI>25), and obese (BMI>30). The use of BMI with its categories was then gradually adopted internationally.

Historically, the adoption of BMI with its pre-defined set categories (overweight/pre-obese; obese; morbidly obese) has been criticised for its links to health insurance and pharmaceutical industry that were the main drivers behind its implementation, as well as the main beneficiaries primarily in the United States (Muller et al., 2016; Tylka et al., 2014). Critics argued that the BMI data had always shown a right-skewed distribution towards a higher ratio of weight to height in the population, with research showing that most Western populations at the time of its adoption had a mean BMI between 24-27. Thus, the adoption of the WHO classification system categories in 1995 meant that around 50% or more of the general adult population, a significant part of the expected normal distribution, was always going to be within the overweight and obese categories, whether or not their health was impaired (Nutall, 2015). One example is the US, where millions of Americans became *overweight* or *obese* overnight without gaining any weight (Nutall, 2015). This consequently led companies to increase their prices for life/health insurance based on the perceived health risks of obesity, regardless of the actual health presentations of individuals (Campos et al., 2006). In addition, the WHO classification of weight has not been updated despite general trends in the population that showed an increase in both weight and height (Nutall, 2015). This data suggests the need for an upward periodical adjustment of the BMI categories to accommodate population-based changes, similar to those done in IQ score categories.

1.3.1 BMI: adiposity, marker of health and risk of mortality

A particular problem with BMI being used as an index of obesity, and by extension of health, is that in and of itself, it is not a measure of body adiposity, as it does not differentiate between body lean and fat mass. This implies that an individual can have a high BMI yet a low-fat mass and still be categorised as obese. Furthermore, several studies have highlighted the importance of several variables that impact the BMI, such as gender, ethnicity, age, and leg length (Romero-Corral et al., 2008; Deurenberg et al., 1998; Viner et al., 2010). One such example is in men that present with a higher average BMI but lower fat mass than women (Romero-Corral et al., 2008). Therefore, there is a need for a better, more adequate measure of obesity that reliably measures levels of adiposity, to be used in epidemiological studies. This would help minimise the confounding factors in the knowledge and links of obesity with health and mortality. Unfortunately, thus far, the more accurate measures of the body fat mass (Dual Energy X-ray Absorptiometry, densitometric method, hydrostatic weighing, air displacement method etc.) do not lend themselves easily used in epidemiological studies due to expensive equipment and expertise required which cannot be fitted easily into regular general practitioner surgeries.

Another limitation of the BMI is that it does not capture the body fat location, which has been shown in the literature to be a more accurate indicator of associated health risks (Pischon et al., 2008). Studies have shown that it is instead the accumulation of fat adiposity in the upper part of the body than the lower part of the body that is associated with an increased risk of coronary heart disease, diabetes, gallstones, and gout (Pischon et al., 2008) which has led clinicians to use the waist circumference alongside BMI to determine the health risks of an individual with *excess* weight. To further challenge the claim that fat mass is itself pathological, it is worth noting that in a study where a significant amount of body fat mass was surgically removed in women following liposuction, health markers did not significantly improve at 10-12 weeks follow up (Klein et al., 2004). Whilst the sample size of the study was small, the results contrast with those coming from studies looking at lifestyle modification programmes where individuals lose only a small amount of body fat yet experience significant health improvements (Appel et al., 1997).

Another central claim in the *war on fat* is that mortality increases with the degrees of overweight as measured by the BMI (WHO, 2003). There is, in fact, weak evidence from the epidemiological literature of this claim, except for extreme obesity 40+ (Hotchkiss & Leyland, 2011). Several studies have found a U-shaped relationship between BMI and mortality, with both extreme ends of the BMI showing significantly increased mortality (Troiano et al., 1996; Winter et al., 2014). Although risks for excess deaths levels in the underweight population

(BMI below 18.5) were reportedly more significant than for people living in larger bodies as measured by the BMI (> 35), it is rare that we are informed of these risks or that they get negative media attention, mostly weight stigma being targeted towards people at a higher weight. Some highlight this is due to anorexia being classified as a mental illness and, by extension, suggest that classifying obesity as a physical/mental illness will help remove some of the attached weight stigma (Flint, 2015; Allison et al., 2008).

1.4 Incidence, prevalence, and costs

In the United Kingdom, obesity, as measured by the BMI, has reportedly risen almost doubling since 1993 (National Health Service Digital [NHS Digital], 2021). In January 2021, the Obesity Statistics Briefing Paper reported that following the Health Survey for England 2019, 28% of adults are living with obesity, with 3.3% of these individuals living with morbid obesity (BMI greater than or equal to 40kg/m^2). Furthermore, it was reported that the proportion of women living with obesity (29.1%) is slightly above that of men (27%). In 2009, the Department of Health (DoH) estimated that by 2050 half of the adult population in England will be living with obesity (Department of Health [DoH], 2009). However, whilst obesity prevalence between 1993 and 2000 increased steeply, since 2000, these increases happened at a slower rate, with the last health survey showing a decrease of 1% in prevalence since 2017, thus not supporting this estimation.

1.4.1 Obesity *epidemic/pandemic*

The terms' *epidemic*' and '*pandemic*' have been used in association with obesity as early as the middle of the 1990s (Campos, 2004). The term epidemic refers to a rapid spread of an illness, in a short period, to large numbers of individuals across a population (Gard & Wright, 2005). Historically, the terms epidemic and pandemic have been consigned to infectious diseases with high numbers of deaths. The association of this emotionally charged label with obesity has captured media attention and led to the increasing stigmatisation of individuals living in larger bodies within popular media outlets. Most worryingly, is that the language used by researchers in scientifically and peer-reviewed journals fed into the *war on fat*, some going as far as to call obesity a pandemic crisis that needs to be treated as a 'threat greater than terrorism' (Meldrum et al., 2017, p. 837). Such alarmist statements are then reproduced in mass media, which assigns responsibility to the individuals living in larger bodies for this epidemic/pandemic. So, what are the numbers behind this epidemic?

Between 1990 and 2000 it was reported that there was a steep increase in the number of people 'diagnosed' with obesity, in reality, studies show that most individuals gained within these ten years somewhere between 3-5 kg which slightly changed the weight distribution to

the right (Friedman, 2003). In addition, there was a reported trend of an increased height in the population, which may have wrongly placed people in the *overweight/obese* categories, and improperly inflated the '*epidemic*' rates of obesity reported in the literature (Gard & Wright, 2005). Similarly, since 2000, the reported changes in weight in the UK were not exponential and mainly were reported within the extreme obesity population (Health Survey for England, 2019). As stated above, the UK data shows a stagnation if not an actual minimal decrease in the prevalence of obesity between 2017 (29%) and 2019 (28%). The current numeric data does not support the 'catastrophic' and exponential increases that define an *epidemic* or *pandemic*, yet the language around obesity remains unchanged, leading some researchers to question the socio-political implications of this approach (Campos et al., 2006; Colls & Bethan, 2014).

In the context of the COVID-19 pandemic, obesity has been put under much scrutiny. The tragic number of deaths reported worldwide on account of the coronavirus should caution researchers and public health officials in the light use of the term pandemic as associated with obesity. It should encourage researchers towards a more balanced and less sensationalistic approach to reporting data, particularly given the scientific evidence that shows the detrimental impact that weight stigma has on individuals living in larger bodies, which will be further outlined in the following paragraphs (Puhl et al., 2020a; Friedman & Puhl, 2012). Guided by the BPS ethical code of conduct (2018), applied psychologists have a pivotal role in helping their counterparts across disciplines use non-stigmatising language in reporting findings, contextualising them socio-economically, empowering individuals and informing public policy and services.

1.4.2 Obesity in UK during COVID-19 pandemic

In their recent policy paper, called *Tackling Obesity: Empowering adults and children to live healthier lives*, the government outlined their concern about the higher mortality rates found in people living in larger bodies after contracting the COVID-19 virus (Department of Health and Social Care, 2020). The paper also expressed the government's concern about other serious health risks posed by obesity (Guh et al., 2009). For example, one article quoted in the briefing paper reported that obesity correlated with cardiovascular diseases, diabetes Type II, 12 types of cancer (except oesophageal), osteoarthritis and chronic back pain, as well as higher mortality rates (Guh et al., 2009). Nonetheless, the above associations were stronger for the Waist Circumference of individuals rather than BMI, which research suggests is a more accurate indicator of risk across all BMI categories (Nutall, 2015). Furthermore, association does not mean causation. Many confounding variables were not controlled for in the study, such as stress levels, weight stigma, physical activity, family history of the illness etc.

The government further encouraged individuals living in larger bodies to lose 2.5kg, within their policy paper, estimating that this may help save the NHS £105 million over the next five years. However, this estimate was based solely on one study that included 272 individuals with a BMI over 30, that were offered a Low-Energy Total Diet Replacement Program (TDR) from which these calculations were computed on a long-term basis (Kent et al., 2019). In their study, Kent and his colleagues estimated these costs based on the assumption that individuals return to their previous weight or 1 kg below this and maintain there. They did not acknowledge that often weight regain after low-calorie diets lead individuals to further dieting attempts (MacLean et al., 2011; Brownell & Rodin, 1994). Additionally, weight-cycling has been shown to have a negative impact on individuals living in large bodies (Lissner et al., 1991; Rzehak et al., 2007; Guagnano et al., 2000), with literature showing an increase in healthcare costs (increase cardiovascular risks, hypertension, chronic inflammation, some forms of cancer etc.) as well as mortality risks (Kroke et al., 2002; Cereda et al., 2011; Vergnaud et al., 2008; Kajioka et al., 2002).

Furthermore, obesity was framed in their policy paper as a social 'burden' on the NHS, estimating its financial costs to be £6.1 billion each year in addition to the staffing costs (the time pressure on the medical staff that could otherwise attend to other health problems). The paper also stipulated the DoH (2009) estimation of an exponential increase in the costs of obesity-related conditions and the government's commitment to tackle this public health issue. Nonetheless, by framing obesity as a 'burden', the government further contributed to the stigmatisation of individuals living in larger bodies disregarding the evidence-based it claimed it wanted to use to support its *fight against obesity*. Furthermore, the briefing paper primarily focused on assigning the responsibility to change their weight to individuals living in larger bodies and only briefly touched on the psychological, social, environmental, genetic factors that contribute to obesity, despite overwhelming research data highlighting the complex interactions amongst these factors (Foresight, 2007). The following paragraphs will further outline the causes of obesity.

1.5 Causes of obesity

There has been much interest in recent years, particularly since the start of the pandemic, from a variety of stakeholders such as healthcare professionals and policymakers in the aetiology of obesity. In 1991, the UK government publicly reported obesity as a national health threat that would need targeted measures (Jebb et al., 2013). Although tackling obesity has reportedly been a policy 'priority' for the past 30 years, and it led to the implementation of a few health campaigns, community interventions and service developments (weight

management services), these had a minimal impact and, at first glance, were insufficient in managing obesity given the reported rise in obesity rates over these years (Hazlehurst et al., 2020; NHS Digital, 2021). Scientists believe that to target the problem of obesity effectively, it is imperative to determine its causes, as some propose this would give us an understanding of how to help people lose weight and maintain their weight-loss. Others, however, argue that weight-loss is not and should not be the ultimate goal. Rather, understanding the aetiology of obesity might help destigmatise the public discourse around individuals living in larger bodies (Tylka et al., 2014; Friedman & Puhl, 2012). Broadly, it is considered that individuals gain weight as a result of an energy imbalance, where they might take in more energy than they expend by eating too many calories whilst living sedentary lifestyles (BPS, 2019). Over the years, the literature into the causes of behaviours that lead to obesity has highlighted a complex combination of factors sitting at the intersectionality of biological, psychological, social, and environmental influences. These dimensions are further described in the sections below and were included in the Foresight Tackling Obesities Report (2007).

1.5.1 Biological influences

It is broadly accepted that biological processes contribute to human behaviours across developmental stages and may influence a person's weight, shape, and size. Genetic studies undertaken with twins and families have found that 50-to-90% of the susceptibility to gain weight is genetically influenced (Elks et al., 2012). Over 100 genes have been linked to obesity and weight differences (Locke et al., 2015). These have been hypothesised to regulate the neurobiological wiring of the brain and thus appetite regulation (Locke et al., 2015). Cornelis and his colleagues (2014) found genetic influences for emotional eating, satiety and an individual's interest in food, that have more recently been corroborated by de Lauzon-Guillan (2017). The literature in biological processes of obesity has thus far highlighted that some individuals may be at a high genetic risk of overeating in response to environmental factors (Konttinen et al., 2015). Nonetheless, there is no simple pattern of genetic inheritance that can easily explain obesity, as the contribution of environmental factors complicates these findings. One such environmental factor that can impact a person's neurobiological processes is stress. Researchers have found a strong link between stress and obesity (Sominsky & Spencer, 2014).

Several mechanisms have been proposed for how stress may influence the tendency to gain weight. Chronic stressors reduce the activation of the prefrontal cortex, responsible for decision making and planning, which may lead to a poorer eating pattern and/or food choices. Furthermore, an individuals' exposure to persistent stress has been linked to the accumulation of visceral fat around the organs, which in turn has been linked to higher risks of developing

health conditions such as diabetes, hypertension, cardiac problems (Spencer & Tilbrook, 2017). Chronic stress has also been shown to impact the hormonal balance of individuals, which has been associated with appetite increase and a predilection for fat or sugary foods (Sominsky & Spencer, 2014). Stress further affects an individual's sleep quality, which may make people hungrier, leading them to crave high-density foods to upkeep energy levels, predisposing them to weight gain (Reutrakul & Cauter, 2018).

1.5.2 Psychological influences

Researchers face a distinct challenge in distinguishing the direct contribution of psychological factors from biological and socio-environmental influences associated with the development of obesity. Nonetheless, literature has highlighted links between cognitive and emotional processes and the behaviours that lead to overweight and obesity.

Adverse childhood experiences (ACE) have been linked to behaviours that lead to the development of obesity via the body's chronic activation of the stress response system (Hemmingsson et al., 2014). One such example is overeating. Early adverse experiences may impact an individual's ability to form a secure attachment to caregivers, hindering their ability to self-soothe in a non-problematic way. This may thus increase their reliance on other substances, such as food, to provide emotional comfort (Schore, 2003). Nonetheless, there is a complex reciprocal interaction between childhood adversity and weight gain that may impact the motivation of individuals to exercise and self-care, their food preferences and their eating patterns (Craigie et al., 2011).

In their meta-analysis of adults attending obesity services, Hemmingsson and colleagues (2014) have found that almost half of the individuals had experienced adversities in their childhoods. The experience of psychological adversity in early developmental stages has been associated with poorer mental health, with literature finding a complex reciprocal relationship between mental health and obesity (Hughes et al., 2017). Some studies found that individuals with a mental health diagnosis, particular those with a severe mental illness (SMI), are at higher risks of reaching weight thresholds medically described as obesity (Rajan & Menon, 2017). This is also due to the known impact that some medications for mental health problems have in increasing appetite (Bak et al., 2014, Reynolds & Kirk, 2010). On the other hand, other studies have found that obesity is one of the predicting factors for the onset of mental health problems such as low mood (Roberts et al., 2003).

In addition, there is a well-established and robust relationship between emotions and food, with humans using food in response to both positive and negative emotions. Whilst, for some, the association is unproblematic, for others, this may predispose them to emotional eating and

thus higher risks of gaining weight and reaching obesity thresholds. Some researchers suggested that individuals may use food to *mask* (Polivy & Herman, 1999) or *escape* (Heatherton & Baumeister, 1991) difficult emotions. These theories suggest that overeating may help distract individuals from distressing emotions, offer them a sense of immediate gratification and mood improvement, or provide them with the necessary comfort. In support of emotional eating theories, recent studies have found that the ingestion of large amounts of foods that contain fat and sugar lead to the release of cannabinoids and opioids in the brain, which are the 'soothing' chemicals that help ward off emotional pain (Colantuoni et al., 2002).

Another psychological factor that has been found to contribute to weight is dietary restraint. The Cognitive Restraint theory (Herman & Mack, 1975) proposes that when individuals employ a high level of food restraint, reducing their caloric intake, it triggers feelings of deprivation which are then resisted by the body and may lead to overeating episodes. Whilst media and some health practitioners often promote highly restrictive diets for individuals living in larger bodies; recent research has shown that such interventions may be harmful at both a psychological and physiological level (de Witt Huberts et al., 2013). Research has found that high levels of eating restraint increase an individual's risk of experiencing body dissatisfaction and low mood, which may impact actual weight gain and mental health, increasing the risk of individuals developing eating disorders (Johnson and Wardle, 2005).

A particular eating disorder that has been linked to weight gain is Binge Eating Disorder (BED), defined as the consumption of large quantities of food in short periods of time (two hours) in the absence of compensatory strategies (purging, over-exercising) and the experience of a loss of control whilst eating, followed by feelings of guilt, shame, or disgust (American Psychiatric Association: DSM-V, 2013). Building on the cognitive restraint theory Fairburn (2008) suggested that BED develops when CR is coupled with low self-esteem and body dissatisfaction in individuals. The prevalence of BED amongst people living in larger bodies has been consistently found to be significantly higher (around 30%; de Zwaan, 2001) than in the wider population (2-5% in the wider population Kornstein, 2017). Furthermore, in the current climate in which obesity has been at the forefront of both media and health providers, it is essential to take a social justice lens and contextualise the causes of obesity.

1.5.3 Social and environmental influences

The prevalence and incidence of obesity at a global level have compelled researchers to look beyond individual responsibility to the social and environmental factors that have contributed to obesity (WHO, 2021). The significant changes in the food supply chain, technological

advances and industrialisation have led to the creation of what researchers denounced as '*obesogenic environments'* (Rogers et al., 2018). Currently, the food industry supplies most societies with increasingly large volumes of foods that are high in sugar and fat. Despite their poor nutritional values, the industry is highly skilled in using psychological research to market these products to increase purchases due to their high-profit margins. It is noteworthy that children are primarily affected by these marketing techniques influencing their food preferences across their lifespan, undermining parental efforts, and thus increasing their risks of weight gain (Boyland & Tatlow-Golden, 2017). It is well established that higher weight in early life is strongly associated with obesity in adulthood (WHO, 2021). Furthermore, in the UK, the portion sizes in fast-food restaurants have reportedly increased over the years (Wrieden et al., 2018). As these energy-dense foods tend to be cheaper, manufacturers began packaging larger quantities to make them seem good value for money (Wrieden et al., 2018).

Alongside this food 'revolution', the mechanisation of our environment and technological advances have reduced the need for physical activity required daily, leading to an increasingly sedentary lifestyle (Brownson et al., 2005). Furthermore, sedentary jobs and changes to our physical environment have curtailed people's opportunities to actively engage in physical activity. These declined exercise rates may have perhaps contributed to the reported increased rates of higher weight in the population (Swift et al., 2014).

Another contributing factor to weight gain and higher weight is socio-economic status. Social inequalities have a significant negative impact on children, with a larger number of children from deprived areas reaching *obesity* thresholds (NHS Digital, 2019), which continues to be associated with weight gain and obesity into adulthood. Prayogo and colleagues (2017) found that children from deprived areas or socio-economic backgrounds are more likely to be exposed to high-density, poor nutritional foods. Poverty leads individuals in deprived areas to purchase more energy-dense food that is cheaper and comes in larger quantities, shaping thus food preferences of young children. Studies of deprived neighbourhoods in England have highlighted the concept of 'food deserts' (Shannon, 2014), where nutritious foods are expensive and less accessible in local convenient stores whilst fast-food outlets are more frequently encountered (MacDonald et al., 2007). At the same time, living in poorer communities may impact the availability of green areas and play spaces, and in some cases, may limit an individual's ability to engage in physical activity/exercise due to a lack of safety (Singh et al., 2010).

Therefore, disadvantaged children are more likely to be exposed early in life to low nutritious foods, greater levels of psychological distress and fewer opportunities to engage in physical activity. This will most likely activate any genetic predispositions, shape food preferences

towards energy-dense foods in an environment where this is more readily available, increasing thus exponentially their weight gain risks. This constellation of socio-environmental, psychological, and biological factors has led psychologists towards a biopsychosocial understanding of obesity (BPS, 2019). This understanding tries to veer away from the public narrative that stigmatises and assigns sole responsibility to the individual for their weight, yet it still has some way to go into acknowledging the existence of body diversity and a weight inclusive approach in health interventions.

1.5.4 Weight bias, stigma and discrimination and their impact on weight gain

Weight stigma is a primarily overlooked psychosocial influence in the aetiology, maintenance, and treatment of obesity (Friedman & Puhl, 2012). Weight stigma refers to a set of negative beliefs and attitudes associated with higher weights that lead people/public to engage in discriminatory behaviours towards individuals because of their weight and size. Stigmatising ideologies, suggesting people living in larger bodies are lazy, lack self-control, are unattractive and/or are less intelligent, lead to stigmatising and discriminatory behaviours across settings. Weight and size are visible markers that cannot be concealed, and thus individuals living in larger bodies are more exposed to being stigmatised.

There is ample literature on the pervasive and negative impact of weight stigma on children and young people (CYP). For example, a meta-analysis by van Geel and colleagues (2014) highlighted that young people living in larger bodies are more likely to be teased, bullied by peers, weight stigma being one of the most common types of harassment reported (Bucchianeri et al., 2016). Furthermore, evidence suggests that CYP with a higher weight that experienced weight stigma are more likely to gain weight and reach *obesity* thresholds.

Correlational and experimental studies on community and treatment-seeking weight-loss samples reported consistent associations between weight stigma and maladaptive eating behaviours (MEPs) such as binge eating, emotional eating, uncontrolled eating (Vartanian & Porter, 2016; Major et al., 2014). Studies have also highlighted that there is a decreased motivation to attend to poor dietary habits in individuals that frequently experience weight stigma (Vartanian et al., 2018), with some researchers suggesting that when individuals internalise weight stigma, it moderates the relationship between weight stigma and MEPs (O'Brien et al., 2016). Studies have also highlighted the link between weight-related health conditions and weight stigma (Puhl & Luedicke, 2012), which show that it is rather the individual's exposure to weight stigma and discrimination that is a higher predictor for poorer physical health, than the weight itself (Madowitz et al., 2012; Olvera et al., 2013).

There is increasing evidence into how weight stigma contributes to weight gain. For example, longitudinal studies have found a strong association between weight discrimination and the risk of weight gain and obesity (Jackson et al., 2014; Sutin & Terracciano, 2013). This has led researchers such as Tomiyama (2014) to propose a theoretical model of the cyclical relationship between obesity and weight-based stigma (see Figure 1.1). Tomiyama, has posited stigma as a stressor that elicits physiological activation (e.g., cortisol increases), psychological reactions (shame, guilt) and behavioural responses (MEP) that have all been found to be contributors to weight gain, barriers to weight-loss and also maintaining factors of stigma (Tomiyama, 2014).

Figure 1.1

The Vicious cycle of Weight Stigma reproduced from Tomiyama (2014).

Weight stigma has also been found to interfere with people's ability and/or motivation to engage in physical activity. Individuals are reportedly more likely to avoid physical exercise when they experience higher levels of weight stigma (Han et al., 2018). It can also prevent individuals from attending lifestyle interventions as they may fear discriminatory or abusive behaviours (Mensinger & Meadows, 2017). The experience of weight stigma is linked to a higher level of depression, low mood, and self-esteem (Himmelstein et al., 2018). Studies in both clinical and community samples showed a high association between the experience of weight stigma and poorer body image and quality of life (Latner et al., 2009; Friedman et al., 2008; Puhl & Heuer, 2010).

Furthermore, research suggests that weight bias is highly prevalent within the health care professions (Phelan et al., 2015). Studies have shown discriminatory treatment against individuals living in larger bodies in healthcare, with disparities increasing with the BMI (Puhl et al., 2021). Findings showed that these individuals are less likely to seek treatment even

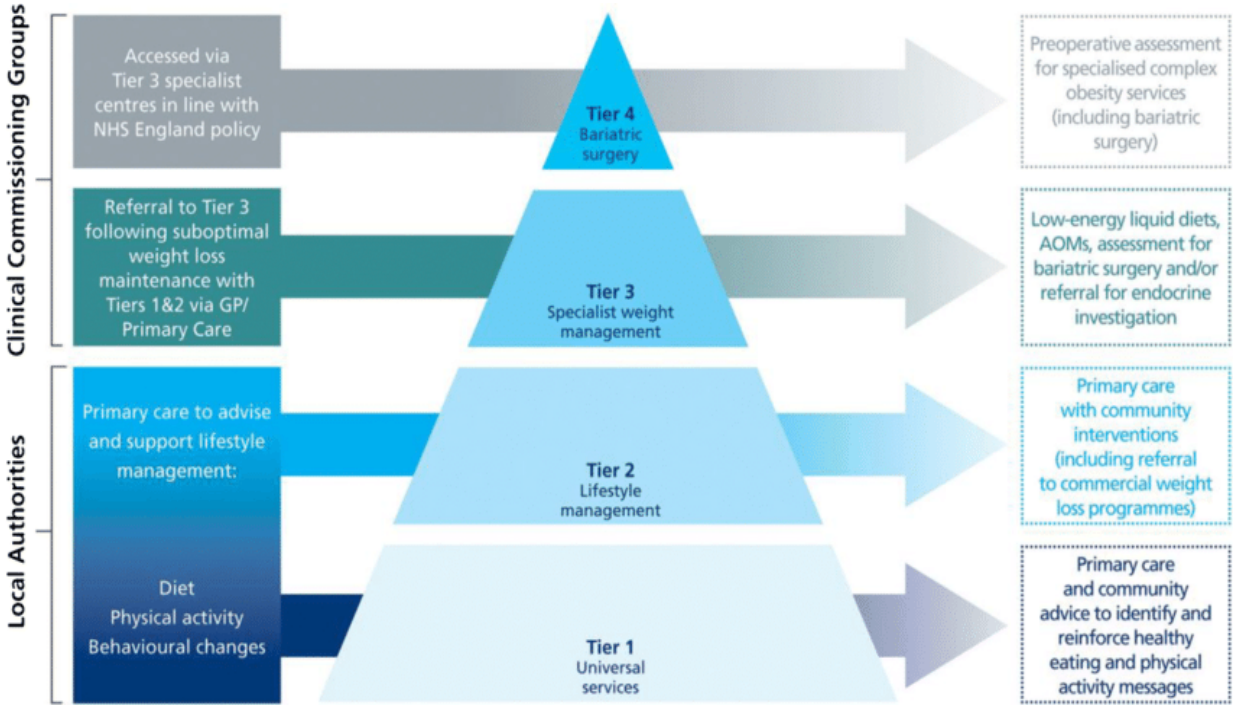
when needed, out of fear of being further stigmatised (Brown & McClimens, 2012), thus potentially explaining the poorer health outcomes reported in the literature (Puhl et al., 2021). Individuals with a BMI over 50 face additional stigma as many healthcare settings are not equipped to accommodate their needs (e.g., furniture, medical equipment etc.). Individuals seeking bariatric surgery face an additional layer of stigma for their decision to undergo weight-loss surgery (Vartanian & Fardouly, 2013). A recent study by Hansen and Dye (2018) in a bariatric surgery candidates' sample highlighted that 87% of participants reported surgery-stigma, with half of the respondents reporting hiding their decision from others based on fear of further stigmatisation (e.g., they cheated, have a lack of willpower).

1.6 Obesity management in UK: Treatments of obesity

Within the UK, the management of obesity has developed in recent years based on evidence around the aetiology of obesity, to incorporate multi-component interventions and a multidisciplinary approach as recommended by National Institute for Health and Care Excellence (NICE, 2014) guidelines. These interventions include dietary and lifestyle changes, multicomponent and psychological interventions, medication, and bariatric surgery, as seen in Figure 1.2.

Figure 1.2

The tiered weight management system in England.



Note. The image is reprinted from Hazlehurst et al., 2020.

1.6.1 Tier 1 and 2: Preventative and community-based obesity services

The current NICE guidelines (2014) for adult obesity recommend as a first line of treatment nutritional advice, dietary and lifestyle weight management interventions in the community for individuals with a BMI between 25-40 (Tier 1 and 2). Individuals living in larger bodies are usually encouraged by their GP or healthcare provider to engage in community-based weight management interventions. These interventions are most often structured group-based programmes offered in the NHS, such as Counterweight or commercial programmes such as Slimming World. Based on the evidence, these are multi-component interventions that reduce weight by addressing both diet and physical activity, as this approach has been shown to lead to more significant weight-loss (Sweet & Fortier, 2010). Individuals living in larger bodies are advised to reduce their energy intake by 600 calories, offered information and advice to guide them in making healthier choices and encouraged to combine these dietary modifications with regular exercise. Nonetheless, although these interventions are designed to contain both physical and behavioural aspects necessary for behaviour change, evidence suggests that they are rarely fully implemented due to short-term funding or lack of training (Damschroder & Lowery, 2013). This may help explain the low success rates reported by participants attending such interventions, which show that if weight-loss is achieved, it is short-lived, and last for three to six months (Greaves et al., 2017; Dombrowski et al., 2014).

1.6.2 Tier 3: Weight management services

When unsuccessful, individuals with a BMI of 35 with one or more comorbidities and/or individuals with a BMI of 40 and above, should be offered interventions in specialist weight management services (Tier 3) as recommended by NICE guidelines (2014). These interventions are usually provided in multidisciplinary teams (dietitians, psychologists, medical doctors etc.) and target: diet, physical activity, physiological and psychological issues. Within Tier 3 services, individuals are usually offered a structured specialist weight management intervention delivered in a group setting and lasting for a minimum of six months. During these multi-component interventions, participants are typically asked to adhere to either a calorie-restrictive, meal replacement diet, a low macronutrients diet or a healthy dietary style (e.g., Mediterranean-style diet). Additionally, individuals are encouraged to participate in regular exercise. These comprehensive and intensive interventions are psychologically informed and include behaviour change techniques that address maladaptive eating patterns and target motivation. They are usually delivered by dietitians, nurses, and other health professionals, such as psychologists or doctors. Nevertheless, what is the evidence behind these interventions?

1.6.2.1 Dietary, pharmacological and exercise interventions

Dietary interventions propose that weight-loss can be achieved and maintained in various ways by a deficit of kilocalories. Meta-analyses of low- or high-fat (Tobias et al., 2015) and low- carbohydrates diets (Avenell et al., 2018) showed a weight-loss of between three and five kilograms at six months follow-up. A systematic review by Franz and colleagues (2007) found that irrespective of the macronutrient content of the diet, at 12 months follow-up, there were no significant differences in weight-loss. Typically, diet-alone studies recommend an average of 1,200 Kcal for women and 1,500 Kcal for men. Diet alone interventions as compared with advice showed superior yet minimal weight-loss up to 36-months follow-up, whilst when looking at a combination of diet and exercise as compared with advice alone, the average weight-loss was higher (Franz et al., 2007). A few studies have compared meal replacement and diet-alone interventions and found more weight-loss in the latter at both 6 and 12 months (Heymsfield et al., 2003). Concerning very-low-energy diets as compared to diet-alone, the latter had shown a significantly higher weight-loss at six months however the results were not maintained at 12 months follow-up and differences were no longer significant (Heymsfield et al., 2003; Tsai & Wadden, 2006).

Exercise alone was found to produce superior weight-loss as compared to advice-alone at 12 months follow-up (2kg; Franz et al., 2007) with structured aerobic exercise interventions producing a typical 2-3% weight-loss in the absence of dietary interventions. Systemic reviews highlighted that when combining exercise (aerobics, resistance training, brisk walking etc.) with dietary interventions they produce a typical 8-11% weight-loss at 6 months (Chin et al., 2016). Importantly, in their meta-analysis, Franz and his colleagues have identified that, irrespective of what dietary intervention and/or exercise participants followed across studies, weight-loss appears to plateau at approximately 6 months. Furthermore, that even when a reduced energy intake was maintained or further decreased participants did not continue to lose weight past this point. However, if they discontinued the weight-loss intervention followed, participants were likely to regain their weight.

In regard to pharmaceutical interventions for obesity, Haddock and colleagues (2002) reported in their meta-analysis the absolute placebo-subtracted weight-loss of single drugs (Orlistat, sibutramine etc.) was of up to 4kg. In trials lasting between 6 months and a year, sibutramine produced 4.3kg weight-loss and orlistat 3.4kg in weight-loss (Glazer, 2001). Nonetheless, the side effects of these medications lead to high drop-out rates, and to date, Orlistat is the only drug approved in the UK. Whilst these dietary, exercise and pharmaceutical interventions have shown to be effective short-term, there is ample literature contesting their long-term impact and highlighting their potential adverse effects on health. Meta-analyses have shown that only

20% of participants attending weight-based interventions maintain weight-loss at one-year follow-up, and the percentage decreases with time (Wing & Phelan, 2005). A meta-analysis of such interventions in the United States has shown that at a five-year follow-up, all participants regained on average 77% of their initial weight-loss (Anderson et al., 2001).

1.6.2.2 Psychological interventions: critical evaluation

The management of obesity requires behaviour change on the part of the individual (eating patterns, activity, medication etc.), which highlights the need for psychological interventions that help support behaviour change. The best-established psychological interventions for weight-loss are Cognitive Behavioural Therapies (CBT; Acceptance and Commitment Therapy-ACT, Dialectical Behavioural Therapy-DBT) and Behavioural Therapies. Most psychological interventions offered to manage obesity incorporate behavioural change mechanisms from the Coventry, Aberdeen, and London-Refined (CALOR-RE) taxonomy of behaviour change techniques. This is based on the Behaviour Change Wheel (BCW; Michie et al., 2014) framework and incorporates predominantly psychological techniques to increase physical activity and encourage healthy eating.

Literature in Cognitive Behavioural and Behavioural Therapies for Weight-loss (CB/BTWL) is heterogeneous, with interventions being delivered by different professionals (dietitian, psychologist etc.) having a variety of frequencies, lengths, different follow-up timepoints, and different measures to report weight-loss and/or psychological wellbeing. However, most of these interventions typically include self-monitoring, regular eating, goal setting, problem-solving, reinforcement. A recent meta-analysis (Jacob et al., 2018) looking into the impact of these interventions as compared with another active treatment (diet, physical activity etc.) or waitlist showed that CB/BTWL led to a modest (-1.7 kg) but greater weight-loss at an average period of 10.7 months. Furthermore, when looking into the impact of these interventions on eating behaviours, researchers reported significant improvements in cognitive restraint (Nurkkala et al., 2015), reduction in emotional eating (Teixeira et al., 2010) and binge eating symptoms (Keranen et al., 2010, Werrij et al., 2009, Cooper et al., 2010).

A recent systemic review and meta-analysis compared CBT and BT interventions on obesity treatment by subtypes of patients and included 21 Randomised Control Trials (Cha et al., 2020). Researchers reported that for patients that live in larger bodies (>30) with no other mental health comorbidities, CBT showed superior weight-loss to BT after 12 weeks or more follow-up. However, in patients living in larger bodies (>30) with binge eating, the results were mixed, with CBT interventions significantly reducing binge eating, whilst BT interventions showed better weight-loss and dietary restraint outcomes. In a systemic review of behavioural

interventions in individuals at higher weights categorised as having moderate or severe obesity, Lv and colleagues found that 32%-97% of these achieved 5% weight-loss, with 3%-70% of them achieving 10% weight-loss (2017). However, they reported that the interventions that resulted in more than 10% weight-loss up to one year were more robust, took place in inpatient settings, rehabilitation camps hence making their implementations in the community harder.

Studies have also shown the added value of CB/BTWL to dietary and physical activity interventions compared with standalone interventions (Shaw et al., 2005). In their systemic review of the long-term effects of obesity treatments, Avenell et al. (2004) included 84 RCTs, some of which included CB/BTWL interventions. Findings suggested that at 12 months follow-up, CB/BTWL added to dietary intervention was associated with greater weight-loss (-7.67kg; 95% CI -7.31 to -2.38 kg) as compared with adding exercise (-1.95kg; 95% CI -3.22 to -0.68 kg), although the sample sizes were very small. At 36 and 60 months follow up, only the addition of exercise to dietary interventions still showed significant weight-loss. More recently, technological advances have made possible the delivery of CB/BTWL using websites, smartphone applications and text messaging. However, there is currently little literature on their effectiveness, and studies are heterogeneous. For example, Okoroududu and colleagues (2015) found in their review that web-based interventions for weight-loss had positive outcomes; however, they were not comparative to in-person interventions.

In their review, Johns and colleagues (2014) compared diet and exercise interventions for weight-loss with combined Behavioural Weight Management Programs (BWMP). They reported the superiority of BWMP long-term when compared with both diet-only and physical activity-only interventions in helping individuals achieve greater weight-loss. When evaluating CB/BTWL interventions for severe obesity (BMI > 40), Hassan and his colleagues (2016) found that participants that received lifestyle interventions experienced significantly higher weight-loss than those in the control groups, particularly when lifestyle interventions included dietary and physical components.

A review of Tier 3 Weight management services that offer multi-component interventions by multidisciplinary teams looked at both quantitative and qualitative studies in the UK (Brown et al., 2017). They found that, on average, participants lost 5.7 kg at six months follow-up across studies. Furthermore, they reported that participants' physical activity increased at three months timepoint and declined slightly at six months. Some of the studies reported a reduction in glycaemic control, insulin usage and blood pressure amongst participants. The researchers concluded that Tier 3 services have a short to a mid-ranged positive effect on individuals living in larger bodies in the UK. However, they had a more holistic set of criteria than most studies

assessing success largely based on weight-loss (Alkharaiji et al., 2019). Overall, literature in the best CB/BTWL and/or pharmacological treatments suggest that a weight-loss of approximately 10% of an individual's initial body weight is a typical and realistic outcome. Research further highlights that, on average, one in six adults living in larger bodies maintains weight-loss of at least 10% for 12 months (Yanovski, 2002; NICE, 2014). This suggests that people at higher weights who want to lose weight may require additional support to maintain weight-loss long-term.

1.6.3 Tier 4: Bariatric pathway

NICE (2014) guidelines recommend bariatric surgery to individuals with a BMI greater than 40kg/m^2 or for those with BMI greater than 35kg/m^2 with what they deem are significant obesity-related health comorbidities (e.g., type 2 diabetes, sleep apnoea etc.). For individuals with a BMI greater than 50 or those with a BMI of 30 with a recent onset of Type II diabetes, an expedited referral is recommended to bariatric surgery on the condition that individuals are/or will be engaging with Tier 3 services. Bariatric surgery is a cost-effective, evidence-based surgical intervention that reduces weight and has been associated with improvements in health comorbidities (diabetes, hypertension etc.) for people living in larger bodies (NICE, 2014). Bariatric surgery is offered in Tier 4 services by a multidisciplinary team only after other traditional weight-loss methods proved unsuccessful (diet, exercise etc.). There are several bariatric procedures that individuals living in larger bodies are offered within most Tier 4 services, with the following being the most common interventions: Laparoscopic Adjustable Gastric banding (LAGB), Laparoscopic Roux-en-Y Gastric Bypass (LRYGB), Single Anastomosis Gastric Bypass (SAGB), Laparoscopic Sleeve Gastrectomy (Figure 1.3). A description of these most common procedures is offered below:

a) *Laparoscopic Adjustable Gastric banding (LAGB)* is a reversible surgical procedure consisting of an inflatable band placed around the uppermost part of the stomach, creating a small pouch above the main part of the stomach. When individuals eat, the pressure of the band leads to the creation of early sensations of fullness. The band is connected to a small device placed under the skin, to be tightened according to patients' needs after surgery by injecting saltwater solution. Nonetheless, adjusting the band can take time, and the band can also slip, creating discomfort and pain that may lead to its removal. The procedure is less invasive and reversible, and it is less effective in terms of initial weight-loss (40-50% of the excess weight at two years follow up; Kang & Le, 2017). However, the literature suggests that it results in fewer complications than other more invasive procedures and that long term (five years follow-up), the weight-loss outcomes are similar to other surgical interventions (Kang

& Le, 2017; Chang et al., 2014). Whilst this procedure presents fewer risks, there are some common complications, such as port displacement, stomach slippage, rupture band, band erosion (Favretti et al., 2007; Favretti et al., 2009; Launay-Savary et al., 2008). Current literature further indicates that, on average, 12-20% of individuals require additional surgery within the first 12 years following the LAGB intervention (Gagnon & Karwacki, 2012).

b) *Laparoscopic Roux-en-Y Gastric Bypass (LRYGB)* consists of creating a small pouch (40-60ml) using surgical staples at the top of the stomach. The pouch is then attached to the divided small intestine, thus bypassing the rest of the stomach, which results in feeling full faster. The surgery results in weight-loss of roughly 70-80% of an individual's excess weight within two years, with patients reporting decreased hunger due to hormonal changes (Osland et al., 2017). In addition, the LRYGB has the highest and fastest reported remission of Type II diabetes. Nonetheless, it has been associated with the highest rate of complications such as leakage, ulceration, hernias, with a meta-analysis showing a 21% [95% CI, 12%-33%] rate of complication (Chang et al., 2014). Furthermore, individuals may develop vitamin and mineral deficiencies, hence needing to take multivitamin tablets for the rest of their lives. Individuals can also develop a condition known as dumping syndrome when eating sugar or large amounts of food (nausea, diarrhoea etc.). These side effects can be very unpleasant and negatively impact the quality of life of individuals post-surgery (Coulman et al., 2020).

c) *Single Anastomosis Gastric Bypass (SAGB)* is similar to the LRYGB; however, the small intestine is not divided and is attached to the small pouch created with surgical staples (60-100ml). It has similar effectiveness to the LRYGB yet is less complicated to perform (Lee &Lin, 2014). Nonetheless, individuals may experience similar side effects to the LRYGB intervention and must adhere to the same lifelong changes to lifestyle.

d) *Laparoscopic Sleeve Gastrectomy (LSG)* involves the creation of a narrow tube-like stomach and removal of the remainder part of the stomach, which leads to a smaller capacity. It is usually the first option offered to individuals living with super obesity (BMI >50). However, the sleeve gastrectomy may lead individuals to develop distressing reflux in around 10% of cases which may impair their quality of life and enjoyment of food, also restricting some of the types of food they can safely consume (Shi et al., 2010). Literature has also shown that 30-50% of patients regain a substantial weight long term at 5 to 10 years follow up (Shi et al., 2010).

Figure 1.3

Types of weight loss surgery procedures: gastric band, gastric bypass, sleeve gastrectomy (left to right)

Note. Reproduced from NHS weight loss surgery website: https://www.nhs.uk/conditions/weight-loss-surgery/types/

Currently, there is no universal consensus or recognised definition for what success or failure looks like in bariatric surgery in terms of weight loss and metabolic criteria (Mann et al., 2015). This has led to a great heterogeneity of reporting success/failure in the bariatric surgery literature, with some studies using *excess* BMI loss as an index, BMI changes or reporting the total body weight loss as an index (Mann et al., 2015). Nonetheless, as described in the above paragraphs, there is variation in the expected amount of weight-loss across types of surgical interventions, making it hard to establish a single threshold that would unanimously determine success/failure rates (Chang et al., 2014). Furthermore, it may be necessary to further consider metabolic changes and remission of comorbidities related to obesity as defining criteria for marking the success/failure of bariatric procedures, particularly as some individuals may be accessing bariatric surgery specifically with a view of improving health-related comorbidities (Mann et al., 2015). Overall, the existent heterogeneity across the literature makes it hard to reliably establish the current success rates of bariatric surgeries.

In the UK, the British Obesity and Metabolic Surgery Society (BOMSS) has established the National Bariatric Surgery Registry in 2009 to collect data on surgery outcomes. A study (Miras et al., 2018) analysing the data collected in the NBSR between 2000-2015 showed that, on average RYGB procedure was the most popular choice in the UK (51.4% of reported cases), followed by the sleeve gastrectomy (SG; 20.2%) and the adjustable gastric band (AGB; 19.7%). Over the years, authors reported a decrease in the number of AGB procedures with an increase in the percentage of SG procedures. In addition, a small percentage (8.7%) of other surgery procedures, such as duodenal switch, gastric balloon, was reported. Based on the data collected in the NBSR, across the different types of procedures, there was an overall 30 ± 12% total body weight loss at two years follow up, followed by a period of weight

regain. At five years follow-up, the total body weight-loss reported across procedures was 24 ± 13%. These findings are aligned with the literature that suggests that overall, 20-30% of individuals undergoing bariatric surgery regain weight as early as six months post-surgery (Courcoulas et al., 2013). Researchers further reported that over the five-year follow-up, a statistically significant reduction was observed in the prevalence of prior reported weight-related comorbidities, such as Type II Diabetes, hypertension, dyslipidaemia, sleep apnoea, asthma (Miras et al., 2018). This evidence suggests that surgical interventions are more effective in helping individuals lose and maintain a significant amount of weight-loss and improve their health-related comorbidities compared to non-surgical interventions, which have been shown to produce on average up to 10% weight-loss with high rates of weight regain at two years follow-up.

Nonetheless, all bariatric surgeries come with risks and complications. When reviewing the NBSR, Miras and his colleagues (2018) reported that 0.3% of individuals had experienced cardiovascular complications post-surgery. In addition, they found a mortality rate of 0.07% recorded in the hospital. Outpatient mortality rates were not recorded. The overall postoperative complications rate reported in the NBSR between 2000-2015 was 3.1%, with some of the most common complications being vomiting/poor oral intake and pneumonia/atelectasis. These findings are aligned with international meta-analyses that reported similar mortality rates (0.31%; Chang et al., 2014), yet higher complications rates across studies (17%) compared with those reported in the NBSR. This may be due to the differences in defining and thus recording postoperative complications.

Of note, is that despite the rates of complications that may lead individuals to experience unpleasant symptoms that may impair their quality of life, psychological aspects and quality of life are not yet considered as factors in determining the success/failure of bariatric procedures. Furthermore, whilst most studies show an improvement in the quality of life of individuals post-operatively (Major et al., 2015; Batsis et al., 2009) it remains unclear what the impact of bariatric surgery is on the long-term mental health of individuals (Mazer, Azagury & Morton, 2017). Szmulewicz and his colleagues (2018) undertook a meta-analysis of 11 studies (731 participants) and found that the mental health quality of life did not improve significantly postoperatively from baseline or as compared with participants attending non-surgical interventions. One example of how psychological factors may be relevant to determining the success of surgery may be that of individuals who lose a significant amount of weight post-surgery yet experience significant side effects, such as vomiting, that may severely impair their quality of life, food enjoyment and daily functioning. While weight-loss may lead to improvements in physical mobility and the remission of their comorbidities, which may suggest

for surgeons that the intervention was a success, the individuals may struggle to function in their daily life. Hence, it would be necessary for the NBSR to consider not only the presence of complications post-operatively but also their severity, alongside other psychological factors, such as quality of life.

This is particularly relevant in view of the fact that post-surgery, most individuals are followed for up to two years by their bariatric service, usually with only six-monthly appointments after the first year. However, there is a great variety of practices across the UK bariatric services, due to the difference in the amount of resources and funding they have at their disposal (Ratcliffe et al., 2014). After the first two years, individuals should ideally be discharged into the care of Tier 3 services that benefit from a multidisciplinary approach and are equipped and trained to recognise surgical complications and meet the complex needs of individuals following surgery (e.g., dietary advice, psychological intervention, referral for further investigations etc.). Nonetheless, more often than not, due to the scarcity of Tier 3 services across the UK, individuals are discharged into the care of their GPs, that may not have the specialist training needed to identify symptoms related to surgery complications (Coulman et al., 2020). This may mean that some of these complications may not be addressed promptly (e.g., revision surgeries) and may also be underreported.

Nevertheless, before individuals living in larger bodies receive bariatric surgery, they must undergo a lengthy process. In the UK, according to the NICE guidelines, there are a stringent set of criteria that individuals need to meet prior to being considered for weight-loss surgery. Adult individuals need to have been seen under a Tier 3 service for 12-24 months, attend appointments, adhere to pre-surgery diet and physical activity recommendations quit smoking, lose weight (NICE, 2014). However, Tier 3 services are scarce, and as such, individuals have to demonstrate they have engaged with their equivalent in lifestyle modification for at least 12 months, at their own expense, by providing evidence of attending a weight-loss program or gym. In addition, individuals referred to the bariatric pathway are required to undergo a specialist psychological assessment. The purpose of the psychological assessment is to screen for eating disorders and any other psychological factors that may impact an individual's ability to adhere to the postoperative care requirements. Furthermore, the psychological assessment aims to ensure that individuals receive the appropriate support to prepare for and make informed decisions about bariatric surgery, reduce their risks post-surgery, plan for post-surgery support and optimise their outcomes.

These psychological criteria have been established based on studies that have highlighted higher than average rates of common mental health disorders in individuals presenting to bariatric clinics, with some studies suggesting a negative impact on their abilities to adhere to

postoperative recommendations and higher weight regain (Dawes et al., 2016; Sheets et al., 2015). For example, a recent meta-analysis by Dawes and colleagues (2016) reported that mood disorders (23%), depression (19%) and binge eating disorder (17%) were the most prevalent mental health conditions amongst individuals seeking or undergoing bariatric surgery. In addition to those meeting the criteria for an eating disorder, studies have found a higher percentage endorsing other maladaptive eating patterns such as emotional overeating, grazing, and uncontrolled eating (Kalarchian et al.,1998; Goodpaster et al., 2016; Conceição et al., 2015). Furthermore, maladaptive eating patterns have been shown in some studies to predict poorer weight-loss and greater weight-regain post-surgery (Ashton et al., 2011; Canetti et al., 2009).

The evidence behind the impact of MEPs and other psychological difficulties on the capacity of individuals to meet the pre-surgery recommendations and thus qualify for surgery or attain and sustain weight-loss post-surgery is, however, mixed (Dawes et al., 2016; Mahawar et al., 2015; Livhits et al., 2009). For example, a recent study by Fisher et al. (2017) reported that at 2.9 years after bariatric surgery, individuals that had a prior recorded mental health diagnosis of bipolar, severe depression, mild to moderate depression presented with similar weight-loss to those with no confirmed affective disorder or other mental health diagnoses.

Despite the mixed findings in the literature, given that 20-30% of individuals experience weight regain following bariatric surgery (Courcoulas et al., 2013), NICE guidelines (2014) identified mental health problems that require active intervention and maladaptive eating patterns as treatment-limiting factors for bariatric surgery. The recommendations further stipulate that individuals on bariatric pathways should receive psychological support pre- and postoperatively, yet there is a lack of specificity in their purpose and outline (NICE, 2014). In the UK, a survey by Ratcliffe and colleagues (2014) showed significant variation in the provision and scope of NHS psychological bariatric services, with no consistent relationship between the psychological resources and surgery volume. The majority of services offered pre-surgery interventions in the form of psychological assessment, with a few offering more complex psychological interventions pre- and post-surgery; however, the survey did not capture data from all UK bariatric services. The lack of service provision may be partially due to lack of funding and/or lack of specificity of NICE guidelines and also the mixed findings in the pre- and postoperative psychological intervention literature (Stewart & Avenell, 2016; Kalarchian & Marcus, 2015)

More recently, to fill this lack of specificity in recommendations, Ogden, Ratcliffe and Snowdon-Carr (2019) have proposed guidelines for psychological support pre- and post-bariatric surgery commissioned and endorsed by the BOMSS (Ogden et al., 2019). Their

guidelines propose that a stepped care model of psychological interventions be included in all bariatric services. In addition, they highlight that individuals on bariatric pathways who present with eating specific difficulties at psychological triage screening should be offered as first step online self-help materials. When insufficient, as a second step, they should be offered a group intervention and, if this is unsuccessful in addressing their problems, in Step 3, they should meet with an applied psychologist to address their eating difficulties on an individual basis. Nonetheless, there is still a gap in the provision of most bariatric services. Thus, pre-bariatric individuals that meet the criteria for MEP are most often discontinued on the pathway and referred for psychological intervention to local mental health services and only after treatment surgery is considered. Moreover, the NICE (2017) guidelines for BED recommend either 16-week Cognitive Behaviour Therapy (CBT) group intervention or 20 sessions of individual CBT. Consequently, due to the long waiting lists for NHS psychological interventions and the long interventions, the waiting times for bariatric surgery increase. This may significantly impact the physical health and quality of life of pre-bariatric individuals that cannot proceed with other health procedures (hip replacement) without weight-loss surgery (Mahawar et al. 2013; Jamal et al., 2006).

Nonetheless, there is great heterogeneity across UK bariatric services concerning the degree to which they adhere to NICE (2014) guidelines recommendations. For candidates to surgery, this leads to a postcode lottery in terms of the number of criteria they have to meet to qualify for surgery. These highlight stark inequities in the management of obesity in Tier 4 services, as candidates for bariatric surgery are expected to meet all their criteria to access weight-loss surgery whilst services are not meeting their part of the criteria. Therefore, considering the higher prevalence of MEPs in this client population and the fact that they are a treatment-limiting factor, brief evidence-based psychological interventions should be routinely offered within bariatric pathways to address MEPs enabling individuals to receive the surgery within a timely manner. It would, thus, be essential to review the evidence of such preoperative psychological interventions in a bariatric population.

1.7 Literature review of preoperative psychological interventions in adult bariatric population

The purpose of this literature review is to summarise the body of findings in preoperative psychological interventions delivered by psychologists in the bariatric population and highlight the gap in the literature that this research aims to fill: a lack of evidence-based brief psychological interventions to address MEPs in a pre-bariatric population.

1.7.1 Search strategy and study selection

A literature search was conducted on electronic databases (PubMed, Elsevier, Springer, BMJ, PsychINFO, PsycArticles, Cochrane Controlled Trials etc.) searched through City Library databases and accessed up to February 2021, resulting in 297 studies. The following keyword combinations were used: *pre or *before and *bariatric surgery or *gastric bypass or *gastric sleeve or *gastric banding and *psychological intervention or *behavioural intervention or *psychosocial intervention. Citation tracking was used to review reference lists from relevant articles missed in the databases search (1 study). The full texts of 50 articles were retrieved following titles and abstract screening, with only 14 studies with four follow-up studies (18 studies in total) meeting eligibility criteria and being included. No articles have been found in Counselling Psychology literature, and only one study was based on the UK population. A summary of the studies and their aims can be found in Table 1.

Eligibility criteria were as follows: (1) Studies measured effects of the intervention quantitatively, (2) were published in English and a peer-reviewed journal, (3) participants were aged 18 years and over (4) and were being considered as candidates for bariatric surgery and (5) pre-surgical interventions being considered psychological if delivered by a psychologist, psychotherapist, or therapist.

Table 1

Summary of preoperative psychological interventions for adult bariatric population

	Country	Year	N/N follow up	Sex (F/M)	Mean BMI ±SD*	IG/ CG/RG (R)*	Data collection	Frequency, delivery type, duration	Type of intervention	Aims
Caniato and Skorjanec	Italy	2002	537	411/ 126	46.6±7.2	152/ 385	1-year post-surgery 2 and 3 years	Minimum 10 weekly individual sessions	BST	Evaluated whether a BST intervention can positively impact weight-loss, health status and quality of life.
Brandenburg & Kotlowsky	USA	2005	70	55/ 15	55.5±10. 9	70	1-year post-surgery	6 weekly group sessions, 90min	BT	Assessed patient satisfaction, perceived usefulness of the preoperative program and impact on post-surgical BMI.
Wild et al.	Germa ny	2011	12/10	7/3	45.3± 6	10	Post-intervention	Fourth-nightly 12 group sessions, 75min	Thematic interactional group	Evaluated whether the intervention reduced depressive symptoms in individuals that were undecided and whether it enhanced surgery motivation.
Ashton et al. Asthon et al.	USA	2009 2011	243 128	110/1 8	49± 13	128	Post-intervention 6- and 12-months post-surgery	4 weekly group sessions, 90 min	CBT for BED	Evaluated the effectiveness of the intervention on improving binge eating behaviors post-intervention and at 1-year post-surgery.
Van-Der Hofstadt Roman et al.	Spain	2012	50/25	12/ 13	48.5±7	50 25	Post-intervention 3 months post-surgery	6 weekly group sessions	CBT	Evaluated the effectiveness of the intervention on reducing depression and anxiety pre-surgery and three months post-surgery.
Lier et al.	Norway	2012	141/101	103/3 8	45.2±5.3	49/48/44 34/40/27 (R)	1-year post-surgery	6 weekly group sessions preoperatively, 3 post-op at 6, 12, 24 months follow ups, 180min	CBT and mindful-ness	Assessed whether the intervention program improved weight-loss and treatment adherence (eating habits, physical exercise, vitamins intake).
Abiles et al.	Spain	2013	110		49±9	110	Post-intervention and 1-year post-surgery	12 weekly group of 120 min followed by 52 weekly individual, 60 min	CBT	Assessed changes in weight-loss and general and specific psychopathology (binge eating) following intervention.
Kalarchian et al. Kalarchian et al.	USA	2013 2014	240/171	208/3 2	47± 6.7	121/119 71/72	Post-intervention 6-, 12- and 24-months post-surgery	8 in person, 16 in person/telephone sessions pre-surgery and 3 monthly telephone post-surgery	BT lifestyle	Evaluated whether the intervention improved weight-loss and lifestyle changes (eating behaviors) post-treatment and through 24 months follow up.
Bond et al.	USA	2015	80/75	70/10	45± 6.5	40/35 (R)	Post-intervention	6 weekly individual sessions, 30-45min	CBT	Assessed whether the intervention increased daily moderate to vigorous activity in bariatric individuals as compared with treatment as usual in individuals.
Ogden et al.	UK	2015	162	122/4 0	50.6±5.9 4	80/82 (R)	1 year post surgery	3 individual sessions	CBT	Evaluated whether the intervention had a positive impact on weight-loss as compared with TAU.
Cassin et al.	Canad a	2016	47	39/8	53.1±12	23/24 (R)	Post-intervention	6 weekly sessions, telephone, 55min	Tele- CBT	Evaluated the efficacy of the tele-intervention on improving eating psychopathology and psychosocial functioning as compared with treatment as usual.
Gade et al. Gade et al. Hjelmesaeth et al.	Norway	2014 2015 2019	98 80 61	68/30 55/25 43/18	43.5±4.9 43.7±4.9 43.5±4.4	48/50 42/38 28/33	Post-intervention 1-year post-surgery 4 years post-surgery	10 weekly individual sessions, 4 face to face and 6 by telephone, 60min	CBT	Evaluated the effectiveness of the intervention on dysfunctional eating, mood, affective symptoms, and body weight as compared with TAU
Delparte et al.	Canad a	2019	105	40/36	50.7 ± 9.1	50/45	Pre-, post-group and 4 months follow-up	8 weekly online group sessions lasting 105 min	Online DBT	Evaluated the effectiveness of a DBT group intervention in reducing eating pathology and clinical impairment.
Paul et al.	Nether lands	2021	130	46/17	42 ± 5	53/54	Pre-, post- and 1-year post-surgery	10 weekly sessions 45min	CBT	Evaluated the effectiveness of the CBT intervention on improving eating behavior and psychological symptoms.

Note. N=number, SD=standard deviation, R -Randomized, IG/CG/RG= Intervention Group/Control Group/Reference Group, TAU=Treatment as usual

1.7.2 Preoperative behavioural and lifestyle interventions in adult bariatric surgery population

There is currently a small body of literature in the field of preoperative psychological interventions in the adult bariatric population. Some studies target behavioural and lifestyle interventions (psychoeducation on a healthy diet, planning meals, diary for food, intake of vitamins, training to eat small bites slowly, increase physical activity etc.) Others target psychological factors, such as depression, anxiety, maladaptive eating behaviours that prior research has found interfere with attaining and maintaining weight-loss pre- and post-surgery (Meany et al., 2014). However, both types of interventions aim to support individuals to follow pre-surgery recommendations, prepare for surgery and post-surgery lifelong changes, hoping thus to optimise weight-loss trajectories (Stewart and Avenell, 2016). Firstly, we will describe the findings of lifestyle interventions and secondly, the findings of studies targeting psychological factors.

In the United States (US), Brandenburg and Kotlowski (2005) evaluated participants' satisfaction and perceived usefulness of a behaviour modification group program targeting lifestyle changes in eligible candidates for surgery on a bariatric pathway. Participants were omitted if they presented with *uncontrolled* mental health problems at the time of their psychological assessment on the pathway. Of the 124 participants that had undergone the program, only 70 returned the questionnaires. All participants received a gastric bypass intervention. The data was collected via a survey using self-reported measures designed for the purpose of the study. The group program was six weeks long and consisted of a liquid meal replacement diet and a behavioural lifestyle intervention that all participants needed to follow prior to surgery. The pre-surgical behaviour modification program was underpinned by Behaviour Therapy and consisted of six weekly sessions, each lasting one hour and a half. The researchers highlighted that the program used several behaviour change mechanisms, such as implementing regular eating, food diaries, nutrition and obesity, goals setting and reviewing, cognitive re-appraisal, problem-solving. Overall, they found that the participants reported to have been satisfied with the intervention and to have found it helpful. However, whilst the intervention achieved its aim, researchers did not use standardised measures to assess for behaviour change amongst participants and/or the overall impact of the intervention on behaviour lifestyle, limiting the applicability of the research findings in a clinical context. Moreover, there was only a 56% completion rate of questionnaires, and no control group was used, further limiting their findings' interpretation.

In Italy, researchers looked at the short- and long-term effects of a Brief Strategic Therapy (BST) individual intervention targeting lifestyle changes on weight-loss, health status and

quality of life compared with treatment as usual (Caniato and Skorjanec, 2002). Overall, 152 participants were included in the intervention group, and their results compared with those (385) receiving treatment as usual (TAU). Participants were included if they presented with binge eating, sweet eating, nibbling, gorging and mild to moderate depression. They were excluded if they presented with severe psychiatric illness or bulimia. All participants underwent a gastric band procedure (LAGB). The BST intervention was delivered individually in weekly sessions and was underpinned by several theories such as Radical Constructivism (Von Glasersfeld, 1974) and Systems Theory (Bertalanffy, 1973). On average, participants received six sessions. Whilst the theoretical stance differs from that of other studies in preoperative psychological intervention literature; the researchers reported similar mechanisms of actions, such as cognitive restructuring, problem-solving, goal setting and reviewing. Researchers reported significant results for the group intervention (*N*= 152) as compared with participants receiving TAU (*N*= 385) in excess weight-loss (46% vs 40% EWL, p<.001) and quality of life at one-year follow-up. The positive pattern was maintained over years two and three but was no longer statistically significant. Participants were not randomised to conditions, and the study had high rates of attrition at follow-up (only 80% of BST participants). Nonetheless, participants receiving the BST intervention were arguably part of the population that the literature suggests is at high risk of weight regain post-surgery (binge eating, grazers, sweet eating etc.). As long-term they achieved comparable results to participants in the TAU group, findings suggested that the BST intervention is effective in helping individuals at high risk of weight-regain post-surgery to achieve comparable results to those that are deemed not to be at risk of weight regain post-surgery.

Several studies with higher methodological robustness have also targeted pre-surgery lifestyle interventions. For example, in Norway, an RCT was conducted where participants were either allocated to a six weekly CBT and mindfulness group intervention, a control or reference group to evaluate its impact on weight-loss and adherence to treatment guidelines (Lier et al., 2012). Participants were excluded if they suffered from severe mood or eating disorders. A total of 141 participants were included in the study, with 49 receiving the intervention, 50 being in the control group, and 42 acting as a reference group. Participants received gastric bypass surgery. The participants in the intervention group received six sessions of CBT group preoperatively and three postoperatively. Each session lasted three hours, with one hour being dedicated to mindfulness training. The main components of the intervention were: psychoeducation about surgery, nutrition, eating and physical exercise, problem-solving, cognitive restructuring, food and activity diary, mindfulness. Researchers used a self-reported questionnaire developed for the purpose of the research to measure adherence to treatment: regular eating habits, vitamin intake and physical exercise. No standardised measures were

otherwise used. At one-year post-surgery, no significant weight-loss or adherence to treatment guidelines (e.g., eating habits, vitamin intake and physical activity) was found between groups. Nonetheless, outcomes were primarily based on retrospective self-reported measures that were not standardised, which literature suggests are not reliable (Rosenman et al., 2009). Whilst the study involved randomisation, and a protocol delivered intervention, no standardised measures were used to examine for changes in eating habits, making it hard to generalise findings to the wider population or confidently state the true impact of the intervention itself. Researchers concluded that it is not reasonable to offer a preoperative intervention to all patients undergoing bariatric surgery, yet this was based only on the answers to a three-question self-reported measure which arguably limits the conclusions one can draw from the study.

In the UK, the only study found on the pre-bariatric population was an RCT that looked at the effectiveness of a three-session Behaviour Rehabilitation Service (BRS) on participants' (*N*= 82) weight-loss at one-year follow-up as compared with TAU group (n=80) (Ogden et al., 2015). The BRS intervention involved three individual sessions of 50 minutes each. The first one was delivered two weeks pre-surgery, the second one prior to hospital discharge following surgery and the final session at three months follow-up appointment. The intervention was psychoeducational, and researchers did not stipulate any theoretical or therapeutic model. They, however, mentioned some of the key components: i) psychoeducation about diet, physical activity, ii) addressing beliefs about causes and solutions to obesity, iii) implementing healthy behaviours focusing on diet and exercise, iv) alternative coping strategies, v) adjusting to post-surgery changes. The study's primary outcome was BMI, measured at two weeks preoperatively and postoperatively at 3-, 6- and 12-months. No difference was found following the three-session intervention with a health psychologist (M=16.6, 95% CI= 15.42-17.81) compared with TAU (M=16.37% of EWL, 95% CI= 15.15-17.57). However, given the brevity of the intervention and the fact that it was dispersed in time, it would be hard to conclude based on the results, as the researchers have, whether pre-bariatric psychological interventions are effective in leading to greater weight-loss postoperatively. Furthermore, no other secondary psychological outcome measures were considered, and arguably these variables would have perhaps recorded greater differences between groups both pre- and postoperatively. Researchers argued that the follow-up period would need to be longer because all participants in the study received a gastric bypass that has been shown to produce fairly consistent changes in weight across individuals within the first year postoperatively, leaving little variability in data to potentially capture the impact of the intervention.

Another RCT offering an individual, lengthier (24 sessions pre-surgery) intervention in conjunction with diet and physical exercise reported mixed findings (Kalarchian et al., 2013, Kalarchian et al., 2016). In this study, 121 participants received a lifestyle intervention consisting of 12 face-to-face sessions (one hour) and 12 telephone coaching sessions (15-20 minutes) with a clinician. Their results were compared with those of 119 participants that received TAU. Similar to the above studies, participants with severe or uncontrolled mental health problems were not included in the study. The intervention was underpinned by behavioural theory and was adapted from an evidence-based behavioural weight management program (Mitchell & De Zwaan, 2012). The authors identified some of the following behavioural strategies: psychoeducation on weight-loss surgery, nutrition and physical exercise, self-monitoring, goal setting, problem-solving etc. Researchers aimed at identifying whether the intervention would be successful in significantly improving weight-loss pre-surgery and long-term post-surgery. They measured weight, alongside mood and eating patterns pre- and post-intervention as well as at 6-, 12- and 24-months post-surgery. Participants received either gastric bypass (RXYGB) or gastric band (LAGB). Post-intervention, significant results were found for the behavioural lifestyle group on both weight-loss (MEWL=3.8, $t(182) = 5.01$, $p < .001$) and eating behaviours, and participants were more likely to remain candidates for the surgery post-intervention as compared with those in TAU group.

Similarly, to Lier's findings, these results were not maintained at one- or two-years post-surgery, as both groups achieved comparable weight-loss. Researchers also controlled for the type of intervention when reporting results. However, post-surgery participants' eating habits and mood were no longer monitored, only weight-loss. Arguably, the psychological intervention may have produced secondary psychological benefits on eating habits and mood, which were not captured in the study. Furthermore, the study reported high attrition rates (42% intervention, 39.5% TAU), which potentially imbalanced the composition of groups. Researchers concluded that preoperative lifestyle interventions offered to all bariatric surgery candidates are not successful in improving weight-loss post-surgery but rather pre-surgery. Nonetheless, they suggest future research should be done on vulnerable subgroups of candidates to bariatric surgery, such as those with mild, moderate depression or maladaptive eating patterns.

Mixed results were also found in a randomised trial offering a CBT intervention to improve participants' physical activity (Bond et al., 2015). Forty participants were allocated to the intervention group and compared with 35 participants in a control group. The intervention included both behavioural and cognitive strategies and was underpinned by Transtheoretical

Model (Marcus & Simkin, 1994), Theory of Planned Behaviour (Ajzen, 1991), and Social Cognitive Theory (Bandura, 1997). Some of the mechanisms of action included in the intervention were: self-monitoring, goal setting, problem-solving, planning, modelling, feedback, stimulus control. Participants' activity levels were tracked using an armband monitoring system and diaries. Whilst the authors reported a significant increase in daily moderate-to-vigorous activity levels (20.6 min/day in MVPA, 7.6±11.5 min/day, p= .001) in the intervention group, this was not associated with weight-loss post-intervention, and long-term effectiveness was not measured. Furthermore, participants were remunerated ($50) for their participation, which may have increased their motivation to comply with recommendations, thus biasing the results. These positive results would have been strengthened by recording additional physiological measurements to highlight whether improvements in physical activity translated into improvements in health, given that no significant weight-loss was achieved as a result of the intervention.

Thus far, pre-surgery lifestyle interventions for bariatric surgery suggest only short-term benefits. However, they are heterogeneous in aims (weight-loss, physical activity, satisfaction/usefulness etc.) and treatment components (diet, physical activity, psychological intervention), making it hard to generalise and draw conclusions on the impact of such interventions being offered preoperatively. Furthermore, these studies largely ignored secondary psychological variables such as MEPs shown in the literature to impact weight-loss, short- and long-term (Sheets et al., 2015).

1.7.3 Preoperative psychological interventions targeting specific and general psychopathology in adult bariatric surgery population

In addition to this body of research, there have been several preoperative psychological intervention studies in the adult bariatric population targeting psychological factors. For example, Wild et al. (2011) evaluated the impact of group therapy intervention in reducing depressive symptoms, enhancing motivation for engagement in treatment and improving eating patterns. They reported data from 10 participants that attended their 12-session group therapy (N=10). The researchers, however, did not report the theoretical underpinnings of the group intervention and did not employ a protocol in its delivery. However, they highlighted using some of the following behaviour strategies: i) goal setting, ii) home practice, ii) motivational interviewing, iv) feedback, v) cognitive restructuring. Rather than being led by a psychologist, the groups were supervised by a psychologist and a medical doctor, and participants led the group discussions. The intervention was reported to have been successful in improving depressive symptoms (mean difference between pre- and post- PHQ-9 scores: M= 4.2, CI [0.5; 7.8]) for individuals undecided about bariatric surgery, increasing motivation

for further engaging in treatment. Furthermore, researchers reported improvements in eating behaviours, although these were not measured using standardised questionnaires but rather diaries. However, this was a single-case time-series study, using a small sample size, no control group, or intervention protocol, making it difficult to generalise the positive findings. Furthermore, there was no long-term follow-up to show whether these improvements were maintained over time.

Comparable results on psychological Wellbeing were also reported by Van-der Hofstadt and colleagues (2012). They aimed to assess the effectiveness of a multicomponent program consisting of a very low-energy diet (800 calories) and a CBT psychological intervention on depression and anxiety pre-surgery. The psychological intervention included various mechanisms of change: relaxation training, cognitive restructuring, problem-solving, psychoeducation on diet, nutrition, surgery. Overall, 50 participants participated in the intervention and reported improved depression ($t(49) = 5.9$, $p<.001$) and anxiety ($t(49) = 4.7$, $p< .001$) scores at post-intervention. However, much like in preoperative lifestyle interventions, the results were not maintained for half of the group ($N = 25$) that underwent bariatric surgery at three months post-surgery. Furthermore, the study did not benefit from a control group which could have reinforced its internal validity. The lack of a control group or weight outcomes, reliance on self-reported diary data, together with the small sample sizes and differences in interventions between studies hinder the results' comparability and generalizability.

Other preoperative psychological intervention studies targeted MEPs directly. For example, Ashton and his colleagues (2009) evaluated the effectiveness of a four-week CBT group intervention for binge eating. Overall, 243 individuals participated in the group intervention and reported their binge eating episodes pre- and post-intervention and completed a measure for binge eating (Binge Eating Scale- BES; Gormally et al.,1982). Participants were included in the intervention if they met the criteria for BED and/or endorsed other maladaptive eating patterns (grazing, uncontrolled eating etc.). In addition, the CBT intervention included components such as self-monitoring, regular eating patterns, relaxation training, assertiveness training, surgery psychoeducation etc. At post-intervention, a significant difference was reported for subjective binge eating episodes ($t (164) = 9.36$, $p<.001$) and for binge eating behaviours as measured by the BES. At 12 months post-surgery follow-up, researchers (Ashton et al., 2011) divided participants into responders ($N = 67$) and non-responders ($N = 61$) to the intervention. They found that responders to therapy significantly improved their binge eating behaviours and weight-loss outcomes ($t= 2.01$, $p< .05$) compared to non-responders. However, the study did not have a control group, relied on self-reported

data and a self-selected sample. Nonetheless, the study results suggest that tailoring preoperative psychological interventions to specific vulnerable subgroups within the pre-bariatric population might be most effective in preparing individuals to meet pre-surgery recommendations and improving their long-term post-surgery outcomes (e.g., eating habits, weight-loss).

Another intervention, with a more complex, stepped design, similarly aimed at assessing changes in weight-loss and differences in general and specific psychopathology in a pre-bariatric population (Abiles et al., 2013). One-hundred-and-ten participants recruited from a bariatric pathway were assigned to either a BED or non-BED group following their psychological assessment. Researchers also reported results between participants with a grade III obesity (BMI 40-49.9 kg/m^2) as compared with those with a grade IV obesity (BMI > $50kg/m^2$). Participants first received a 12-session CBT group intervention, each session lasting two hours, that followed Fairburn et al.'s protocol for binge eating (2013). The intervention employed behaviour change techniques such as self-monitoring, stimulus control, cognitive restructuring, problem-solving, psychoeducation on nutrition and diet. All participants were required to lose 10% of their initial weight to complete the CBT intervention and qualify for the surgery.

Following the CBT group intervention, participants were followed in weekly sessions (one hour) for 12-months and were asked to adhere to a 1500 kcal diet. The authors reported significant differences in self-esteem, depression, and eating disorder scores on standardised pre-treatment measures in the binge eating group (Abiles et al., 2013) compared with a non-binge eating group. Post-group, these differences disappeared due to significant improvements in the BED group scores. At one-year post-intervention, researchers found no differences in weight-loss between groups, concluding the CBT intervention offered was effective in treating psychopathological comorbidities regardless of the grade of obesity or the presence of binge eating. Given the stepped-approach and multicomponent intervention, it is difficult to assess which component (group intervention or the individual weekly follow-ups for one year etc.) was more effective. These studies, however, did not have control groups hindering comparisons and generalizability. Furthermore, Ashton et al.'s (2009) study reported that only half of the participants benefited from the intervention raising questions about the intervention's efficacy. Also, there was no follow-up post-surgery in Abiles' and colleagues (2013) study to check whether these improvements were maintained over time.

A more robust study (RCT) targeting eating psychopathology and psychosocial functioning evaluated the efficacy of a pilot telephone CBT intervention compared with TAU on eating psychopathology and psychosocial functioning (Cassin et al., 2016). Participants were

recruited from a bariatric pathway and randomly allocated to receive the intervention (*N*= 23) or TAU (*N*= 24). The intervention was manualised and informed by previous literature into MEPs and BED and adapted for telephone delivery. It included behaviour change mechanisms such as goal setting, psychoeducation on overeating and weight gain, regular eating patterns, self-monitoring, problem-solving, relapse prevention. Participants in the intervention group received six-weekly sessions of Tele-CBT, lasting on average 55-minutes. Eating patterns were measured using standardised questionnaires alongside psychosocial functioning (depression, anxiety, quality of life). In line with prior research, the authors reported significant improvements post-intervention on the Binge Eating Scale (t*(22)* = 2.81, p= .01), Emotional Eating Scale (t*(22)* =3.44, p= .002), and Patient Health Questionnaire-9 (PHQ-9) (t *(22)* = 2.71, p=.01). Whilst the findings suggest that the intervention successfully reduced both eating psychopathology and improved psychosocial functioning, there was no long-term follow-up to ascertain if these results were maintained following surgery. Furthermore, given the sample size (*N*= 47) and high attrition rates (30%) in the study's control and intervention arms, results cannot be generalised.

Similarly, an RCT in Norway (Gade et al., 2014) evaluated an individual CBT intervention in improving dysfunctional eating behaviour, affective eating, mood, and body weight. All participants (*N*= 98) recruited for the study had already been accepted for bariatric surgery and were randomly allocated to the CBT intervention (*N*= 50) or TAU (*N*= 52). The intervention consisted of ten sessions (five face-to-face and five over the telephone) delivered weekly, involving cognitive and behavioural strategies, such as psychoeducation on dysfunctional eating patterns, self-monitoring, regular eating, cognitive restructuring, problem-solving. In line with the aforementioned studies, the CBT group reported significant improvements in their scores on both dysfunctional eating and affective symptoms post-intervention (Gade et al., 2014); however, at one-year follow-up, only the depression results were maintained for the CBT group (Gade et al., 2015) and at four-year follow-up, none of the results was maintained for the CBT group (Hjelmesaeth et al., 2019). Nonetheless, for individuals with minor or considerable depression, CBT was associated with higher weight-loss post-intervention at four years follow-up. In addition, most participants had received gastric bypass surgery (RYXGB), and a small part received sleeve gastrectomy (LSG), with both surgeries long-term achieving comparable weight-loss. Despite these partial results, the authors concluded that pre-surgery CBT intervention was not associated with better long-term outcomes. The study, however, had some limitations, as attrition rates were high at four years follow up (34%), participants were only recruited from public health care systems and were all white, and they had all been accepted for surgery prior to receiving the intervention thus making it hard to generalise the

results across populations. Furthermore, the participants were not screened for binge eating disorder which may have further obscured the findings.

In a recent quasi-experimental study, Delparte et al. (2019) evaluated the effectiveness of an online brief DBT group in reducing eating pathology and clinical impairment on preoperative bariatric candidates. The group was based on the DBT group manual developed by Safer, Telch and Chen (2009) to address binge eating and bulimia. It included some of the following mechanisms of change: interpersonal effectiveness skills, emotion regulation, distress tolerance and core mindfulness skills alongside goals setting, homework etc. Participants were included if they had access to the internet and were on a bariatric pathway; the authors mentioned no further inclusion/exclusion criteria. The participants self-selected whether they wanted to participate in the DBT group (*N*= 57) or TAU group (*N*= 55). Those in the treatment group received eight-weekly online sessions of the DBT group intervention together with TAU. In addition, all participants completed a set of standardised measures pre, post-group and four months follow-up. The researchers reported significant improvements in binge eating, emotional eating, and overall global psychopathology, alongside a reduction in the clinical impairment related to eating difficulties in the DBT group compared with TAU at four months follow up. However, the study lacked randomisation and long-term follow-up and participants that self-selected to attend the group presented with higher levels of psychopathology that was not specific to eating pathology. Nonetheless, these preliminary results are encouraging in regard to preparing individuals for meeting the bariatric surgery criteria.

Lastly, a recent RCT evaluated the impact of a 10-week CBT individual intervention aimed at improving MEPs, depressive symptoms, and quality of life compared with TAU for individuals on a bariatric pathway (Paul et al., 2021). All participants (*N*= 130) included in the study were on a waiting list for bariatric surgery. They were randomised to the intervention group (*N*= 65) or the TAU group (*N*= 65). Participants completed a set of standardised measures pre- and post-treatment as well as one year following bariatric surgery. The intervention used similar behavioural and cognitive strategies to the above CBT RCT (Gade et al., 2014), such as goal-setting, self-monitoring, alternative behaviours, cognitive restructuring problem solving. The researchers reported significant improvements in eating behaviour and psychological symptoms for the CBT group only, between pre- and post-intervention, yet these results were not maintained at one-year follow-up. They concluded that CBT interventions offered preoperatively do not contribute to long-term benefits at post-surgery timepoint, suggesting that the optimal time for psychological treatment may be in the postoperative period. Nonetheless, whilst the study used broad inclusion criteria, the intervention targeted specifically dysfunctional eating and psychosocial functioning, hence arguably, only

participants that struggled with these presentations should have been included for the benefits of the intervention not to be obscured.

1.7.4 Summary, conclusions, and gaps identified in the literature on preoperative psychological interventions delivered on bariatric pathways

The studies presented in this review had different characteristics. They employed either behavioural or cognitive behavioural principles with mindfulness training, brief strategic therapy, or dialectical behavioural therapy and had overlapping behaviour change mechanisms (goal setting, alternative coping strategies, problem-solving etc.). The studies varied in the way they delivered their interventions, with ten being delivered in person, one phone intervention, two mixed face-to-face and phone, and one intervention being delivered online. They also varied how the intervention was delivered with seven group interventions, six individual interventions and one mixed. Furthermore, they had a variety of aims (improving diet/ physical exercise/maladaptive eating patterns/ psychosocial functioning/affective symptoms, perceived satisfaction etc.), based on which they included a diverse set of cognitive and/or behaviour change components. Almost half of the interventions were done in conjunction with a dietary plan. Studies employing behavioural lifestyle interventions had as primary outcome either weight-loss, physical activity, or satisfaction whilst those addressing psychological components alongside weight-loss targeted general or specific psychopathology in pre-bariatric individuals. Across studies, the number of sessions per intervention varied from 3 to 64 sessions, the majority of them lasting six sessions (five studies) for approximately 90-120min and being delivered weekly. There were more female than male participants across the studies. However, this is reflective of the general bariatric population. Four studies collected data just at post-intervention yet pre-surgery, ten studies collected data post-surgery at 3-months, 1-year, 2-years, and 4-years post-surgery. In addition, five out of the 14 studies (36%) included had no control groups and only half used randomisation.

The current review of the literature so far has yielded mixed findings. These findings are further obscured by the small number of studies, with half of them lacking methodological robustness. Nonetheless, all studies that measured short-term benefits (post-intervention) of pre-surgery psychological interventions showed significant benefits on their respective outcome measures and weight-loss. These findings suggest that preoperative psychological interventions may be an effective way to prepare vulnerable subgroups of pre-bariatric individuals on UK bariatric pathways to meet NICE guidelines criteria and ultimately qualify for surgery.

In terms of benefits within the first-year post-surgery, from the nine studies that followed-up participants in this time frame, five (56%) found no benefits of interventions (Lier et al., 2012; Van-der Hofstadt et al., 2012; Ogden et al., 2015; Paul et al., 2021) with the rest reporting benefits either for a subgroup of their participants or a subgroup of their variables (Abiles et al., 2013; Ashton et al., 2009). Only three studies (Kalarchian et al., 2013; Caniato & Skorjanec, 2002; Hjelmesaeth et al., 2019) followed-up participants longer-term at two, three and four years and found the benefits of pre-surgery psychological interventions not to be maintained. The exception was a subgroup of participants with symptoms of depression that reported more significant excessive weight-loss (Hjelmesaeth et al., 2019). Unfortunately, there is a paucity of research with a longer to a year follow-up period. Thus, definitive claims cannot be ascertained on whether the benefits of pre-surgery psychological interventions are maintained longer than a year.

Furthermore, most of the aforementioned body of literature did not adapt their psychological interventions to the psychological profiles of their treatment group, with some targeting very specific issues (e.g., binge eating) whilst having broad inclusion criteria including participants that did not present with clinically significant specific psychopathology. Given the documented diversity of psychological comorbidities in this population, it is likely that this may have obscured the benefits of a targeted intervention. Other studies aimed in targeting multiple psychological difficulties within a limited number of sessions (e.g., three sessions in Gade et al., 2014) despite NICE guidelines recommending different and lengthier treatment interventions to address these difficulties. Arguably, the lack of positive results in these studies may also be due to ambitious designs.

There are several limitations to the conclusions inferred from this literature review. Firstly, the lack of methodological strength in half of these studies. Secondly, many other factors are known to impact weight-loss after surgery, such as the type of bariatric surgery, gender, body mass index, comorbid health, ethnicity, socioeconomic support etc. These could potentially confound the conclusions drawn even further. In addition, studies reported weight-loss in different units making it hard to compare across data. Given this body of research on preoperative psychological interventions, arguably the focus on weight-loss at post-surgery follow-up in most of these studies may take away from the benefits these interventions may have in improving general and specific psychopathology. Thus, more specifically, helping individuals in Tier 4 services in the UK to qualify for surgery in the first place. Also, the primary criterion for success in preoperative psychological interventions, and arguably in bariatric surgery, should be multidimensionally captured rather than reduced to weight-loss.

Some of the gaps suggested by the current body of literature call for studies with greater methodological robustness, follow-up timepoints closer to surgery and inclusion of multidimensional success criteria for bariatric surgery. More specifically to the aim of this study, of the 14 interventions offered, half of them directly addressed specific (BED) or general eating psychopathology (including MEPs such as emotional eating, uncontrolled eating, grazing etc.) with two studies including components to address eating patterns without measuring these using standardised measures. All studies reported benefits post-intervention, with four of these studies following-up MEPs post-surgery (at 6-, 1- and 4-year follow-up) and only two showing long-term benefits maintaining over time. Most interventions were informed by a CBT model, that is currently the gold-standard treatment for eating disorders, with one intervention including mindfulness training and one offering a DBT intervention. Nonetheless, regardless of the therapeutic models that informed the interventions, there was a significant overlap in the behaviour change mechanisms. The interventions, however, ranged in lengths (4 to 36 sessions), making it hard to determine what would be the most cost-effective length of treatment for such interventions being offered on a bariatric pathway, considering the lack of funding for psychological provision on UK bariatric pathways. Overall, participants reported short-term benefits for both face-to-face and online interventions, suggesting that preoperative psychological interventions successfully prepare individuals identified as having MEPs at psychological assessment timepoint to meet criteria for surgery. Further research is needed, as highlighted by the present review, on preoperative psychological interventions on UK pre-bariatric population given the role these may play in preparing individuals for surgery and allowing them to meet their criteria and receive bariatric surgery in a timelier manner.

1.8 Research aims

Informed by the gaps in the research literature, the present study aimed at evaluating a brief CBT-informed group intervention for maladaptive eating patterns in a UK preoperative bariatric sample. The group was underpinned by the Cognitive Restraint, Masking and Escape Theories that covered the different types of maladaptive eating patterns it aimed to address (BED, Emotional Eating, Uncontrolled Eating etc.), and it was informed by the Cognitive Behavioural Therapy model, and integrated strategies from its third wave approaches DBT (Linehan, 2014), Compassion Focused Therapy (Gilbert, 2009) and Mindfulness (Kabat-Zinn, 2003). The theoretical orientation of the group underpinned the following hypotheses. The study utilised a concurrent triangulation design to address the research problem, where both quantitative and qualitative data are given equal priority, and where integration of the study's findings occurs at the data interpretation phase of the research (Hanson et al., 2005).

1.8.1 Quantitative strand research questions

The quantitative strand of the present research study used data collected from five outcome measures Patient Healthcare Questionnaire- 9 (PHQ-9; Kroenke et al., 2001), General Anxiety Disorder- 7 (GAD-7; Spitzer et al., 2006), Three-Factor Eating Questionnaire-Revised 18 Items (TFEQ-R18V2; Cappelleri et al., 2009), Binge Eating Scale (BES), Clinical Impairment Questionnaire (CIA-3.0; Bohn & Fairburn, 2008) at three different timepoints: psychological assessment, pre-group intervention and post-group intervention. Below are outlined the primary and secondary research questions:

Hypothesis 1: There will be a significant difference in participants' self-reported maladaptive eating patterns (MEPs; as measured by the BES and TFEQ-R18V2) across the three timepoints: psychological-assessment, pre- and post-intervention.

Hypothesis 1.1: There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the BES at post-intervention, compared with pre-intervention and psychological assessment timepoints, with no significant difference expected between psychological assessment and pre-intervention timepoints.

Hypothesis 1.2: There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the Uncontrolled Eating (UE) subscale of the TFEQ-R18V2 at post-intervention, as compared with pre-intervention and psychological assessment timepoints; with no significant difference expected between psychological assessment and pre-intervention timepoints.

Hypothesis 1.3: There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the Emotional Eating (EE) subscale of the TFEQ-R18V2 at post-intervention, compared with pre-intervention and psychological assessment timepoints*;* with no significant difference expected between psychological assessment and pre-intervention timepoints.

Hypothesis 1.4: There will be a significant difference in participants' self-reported scores on the Cognitive Restraint (CR) subscale of the TFEQ-R18V2 at post-intervention, compared with pre-intervention and psychological-assessment timepoints. Informed by the CR theory, participants will be expected to present with moderate scores post-intervention with no significant difference expected between psychological assessment and pre-intervention timepoints.

Hypothesis 2: There will be a significant difference in participants' Wellbeing (as measured by the PHQ-9, GAD-7, and CIA) between the three timepoints: psychological-assessment, pre- and post-intervention.

Hypothesis 2.1: There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the PHQ-9 at post-intervention, compared with pre-intervention and psychological assessment timepoints, with no significant difference expected between psychological assessment and pre-intervention timepoints.

Hypothesis 2.2: There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the GAD-7 at post-intervention, compared with pre-intervention and psychological assessment timepoints, with no significant difference expected between psychological assessment and pre-intervention timepoints.

Hypothesis 2.3: There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the CIA-3.0 at post-intervention, compared with pre-intervention and psychological assessment timepoints, with no significant difference expected between psychological assessment and pre-intervention timepoints.

1.8.2 Qualitative strands research questions

The aim of the qualitative strand of the research is to explore the qualitative experiences of participants in attending the brief CBT-informed group intervention and the mechanisms of change that they have found most helpful/relevant from the group intervention. In addition, the study aimed to also provide an insight into how this intervention can influence treatment outcomes and further service development. The main exploratory questions for this study were as follow:

1) What have participants learnt from attending the brief CBT-informed group intervention?
2) What aspects of the intervention did they found most helpful in changing maladaptive eating patterns, if any?
3) What were the challenges they faced in attending the brief CBT-informed group intervention?
4) What was their overall experience of attending the group intervention?

In light of the above literature, the recommendations of implementing a stepped care psychological service provision on bariatric pathways and the call to action by the BPS (2019) in 'tackling' obesity, Counselling Psychologists have an important contribution to bring,

alongside other practitioners and applied psychologists, in working with individuals living in larger bodies. More specifically, guided by the humanistic pillars of the profession, they could arguably bring a social justice lens to the 'problem of obesity' and advocate not only for anti-stigma campaigns but also a shift of framework from fighting *against* obesity and thus inadvertently allying with systems that oppress larger bodies; to fighting *for* equity, access to nutritious foods, better policies and legislation, access to education and living wages that would allow individuals the option to make healthy choices for themselves and their families. More specifically, when individuals living in larger bodies opt for bariatric surgery, applied psychologists can offer evidence-based intervention and support them on their journeys. Counselling Psychologists have the skills and knowledge to bridge between physical and mental health difficulties in providing person-centred, evidence-informed interventions. In addition, they are well versed in working in multidisciplinary teams and have the skills and knowledge required to inform public policies, bringing thus a wider socio-economical contribution in supporting the mental health of people living in larger bodies.

Chapter 2: Methodology

2.1 Overview

This chapter clarifies the methodology through which the research questions and study aims arising from the Introduction Chapter will be investigated. In the following sections, the rationale for the choice of methods to address the research question is explored, including a discussion of the theoretical paradigm utilised in this study. An account of the procedures, recruitment, and data collection strategy alongside the analytic procedures selected for this study follows. Lastly, the critical role that reflexivity played within the mixed methods design is discussed.

2.2 The worldview of the researcher and implications for research study

Within this study, the researcher has taken a pragmatic worldview which is a set of philosophical ideas that have been formed and articulated first by Dewey (1920) and further elaborated by contemporaries such as Murphy (1990) and Morgan (2007). This approach presents as a radical divergence from the usual metaphysical approaches about the nature of reality and what can be known about it, such as more traditional ontological and epistemological approaches (Dewey, 1948). As a first proponent of the pragmatic philosophical approach, Dewey sought to bridge the dualism between realism and idealism, post-positivism and constructivism (Morgan, 2007). In contrast, pragmatism postulates an emphasis on experience. In pragmatism, knowledge is not construed as an abstract concept removed from the knower; rather, it is seen as resulting from experience which is acquired from the continuous feedback loop between the beliefs of the researcher, the actions they take, and their experience of the outcomes, which then modifies/supports their beliefs and informs their subsequent actions. Pragmatism argues that metaphysical concepts, such as the nature of reality and truth, be abandoned and that a more practical research philosophy is pursued to guide the methodological choices of researchers. Thus, within this paradigm, science, though unable to accurately represent reality, has a somewhat functional and practical role in illuminating aspects of it.

The research question is given primacy within pragmatism, and its investigation/pursual is not constrained by the false dichotomy between post-positivism and constructivism. Furthermore, proponents of the pragmatic approach believe that the same question can be viewed and answered from multiple perspectives (Morgan, 2014). Pragmatism as a new paradigm recognises the value of different quantitative and qualitative approaches being used to answer an inquiry. Pragmatism believes that researchers should be guided by a 'what works' best approach in answering their questions. This practical worldview employs diverse approaches

and gives equal value to both subjective and objective knowledge, allowing a combination of quantitative and qualitative data at a methodological level.

It follows that by taking a pragmatic stance, the researcher is not compelled to subscribe or describe their epistemological positioning in combining approaches, as Dewey offered the pragmatic stance as a replacement to existent positions. However, critics of pragmatism expressed concerns with mixed-methods pragmatic researchers not explicitly discussing their epistemological positioning as they believe pragmatism does not inform the reader about the researcher's worldview and how this may have informed their research findings (Lincoln, 2010). To follow suit from the critique, a critical-realist, pragmatic post-positivism ontology and epistemology has been taken by the researcher for this study (Creswell, 2018). This approach has been favoured as it is congruent with the practices of Counselling Psychology, and it is compatible with both the quantitative and qualitative approaches chosen (Tashakkori & Teddlie, 2010).

For the quantitative strand of the present research study, the researcher took a post-positivist approach that accepts the existence of an objective and measurable reality that can be investigated with the relevant methodology. This stance recognises that the one reality cannot be perfectly measured or understood, differentiating itself from the naïve realism or positivist approaches. The constructs of interest in this study were investigated using standardised measures that have been developed over time (e.g., maladaptive eating, depression, anxiety, and weight). However, within this stance, these subject matters are seen as proxies that may not yield themselves to perfect quantification, as they exist primarily within the subjective experiences of individuals.

The epistemological position of the quantitative strand comes in opposition with the relativistic, constructivist approach taken in the qualitative strand of the study that postulates the existence of multiple realities rather than one objective reality. This approach posits that each participant has their perception of reality and that, therefore, multiple realities can co-exist (Krauss, 2005). This contradicts the claims positivist make when they assume one objective reality exists. In the qualitative strand, the researcher conducted semi-structured interviews that sought to explore the different experiences that individuals had of participating in the group intervention and, by doing so, brought a subjective lens to the quantitative findings and complemented their limitations.

Post-positivism ultimately aims to control and predict phenomena by finding the explanation underlying it (Ponterotto, 2005). Unlike the strict positivist approach, the pragmatic post-positivist paradigm recognises the dynamics between scientific knowledge and human error,

that scientific knowledge is primed by the theoretical knowledge and the worldviews of the researcher, as well as the fact that data does not give us a direct window to reality (Willig, 2013). Thus, it recognises the porous boundaries between nomothetic and idiographic knowledge and how they may inform each other. The pragmatic worldview transcends the existing tensions highlighted by the different epistemological positions taken in this study. It advocates for multi-dimensional strategies of investigating reality, integration, complementarity and dialogical communication between data and knowledge (Mason, 2006). Given the poor evidence-based of bariatric psychological interventions, there are benefits in exploring this research area from multiple perspectives, combining methods to help produce a richer body of evidence (Ponterotto, 2005).

2.3 Rationale for a Mixed Methods Approach

The academic field of social sciences was first recognised at the cusp of the 20th century (Creswell & Plano-Clark, 2018). In its plight to consolidate itself as a science alongside other related disciplines, it first adopted the positivist stance that dominated the field. Using quantitative measurements in testing their hypotheses, social scientists looked at understanding, predicting, and controlling reality. These quantitative methods of inquiry allowed for generalisations of results to samples of populations (Creswell & Plano-Clark, 2018). Over time, quantitative methods of inquiry in psychology have been deemed as the gold standard of scientific research, currently being at the top of the evidence-based pyramid in NICE guidelines (2014). However, this was not without criticism of the reductionist perspective of quantitative methods that could not capture the richness of human nature (Willig, 2008). As a result, critics of the quantitative paradigm began using qualitative methods in psychology at the end of the 20th century. These scholars did not try to eliminate subjectivity and inter-subjectivity, rather valued it and looked at producing rich data through the use of in-depth inquires, thus rejecting the traditional science (Guba & Lincoln, 1989; 2005).

The mixed-methods approach combined the quantitative and qualitative methods of inquiry and first began being used in social sciences in the 1960s (Creswell & Plano-Clark, 2018). More specifically, the convergent triangulation design was first employed by Jick (1979) to explore the psychological effects of a business merger on employees. The convergent design involves the collection of both qualitative and quantitative data by a researcher that analyses them separately and then converges the results for comparing or combining purposes (Creswell & Plano-Clark, 2018). The convergent design intended to use different data sets to complement findings and better understand the research query (Hanson et al., 2005).

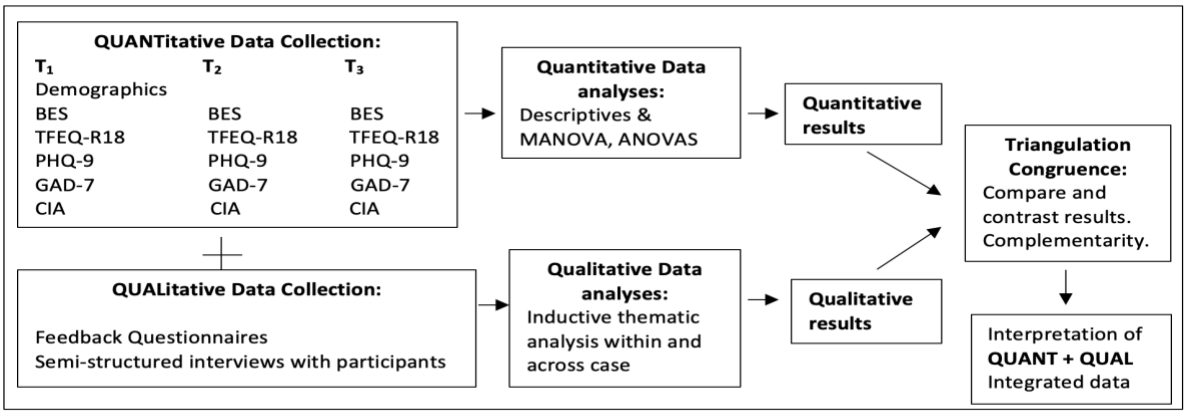
The current study proposed a concurrent triangulation design to address the research

problem. Both quantitative and qualitative data are given equal priority, and integration occurs at the data interpretation phase of the research (as seen in Figure 2.1; Hanson et al., 2005). In this design, the researcher collects and analyses independently two strands of data, qualitative and quantitative, to answer the research question. The two sets of independent results obtained are then integrated and/or compared at the interpretation stage. As outlined above, the intent of using a convergent design was to complement the weaknesses of both quantitative and qualitative methods by bringing together their strengths in the understanding of the research problem at hand (Johnson & Onwuegbuzie, 2004). In this study, by exploring participants' subjective experiences, the qualitative data will be used to help corroborate or refine our understanding of the quantitative findings (Tashakkori et al., 1998).

Furthermore, as per the NHS criteria (NICE, 2014), individuals on the bariatric pathway that struggle with maladaptive eating patterns are unable to proceed to surgery without attending a group or individual intervention addressing these difficulties. Hence, this power dynamic may introduce additional bias in the quantitative strand of the intervention that uses self-reported measures. Therefore, the addition of a qualitative strand may help confirm/disconfirm the findings of the quantitative strand of the intervention. It further offers the opportunity to explore participants' subjective experience of having attended the intervention and areas for development of the group intervention.

Figure 2.1

Description of concurrent triangulation design



*Note: BES- Binge Eating Scale; TFEQ-R18- Three Factor Eating Questionnaire Revised; GAD-7- General Anxiety Disorder; CIA- Clinical Impairment Assessment.

The researcher is aware of the challenges that this design may pose, such as the difference in sample size, combining numeric and text data and the contradictions that may arise from these different data sets. However, they believe that due to a lack of evidence base in the pre-bariatric psychology field, it is imperative that research takes a multidimensional approach

capturing both objective and subjective realities (Kalarchian et al., 2013). The researcher is interested in evaluating a brief CBT-informed group intervention for MEPs by measuring participants' objective scores on standardised measures and exploring their experience of the group to further inform the development of the intervention, hence the pragmatic choice of a mixed-methods design.

2.4 The Research Design

In the quantitative strand of the study, the researcher opted for a repeated-measure quasi-experimental design (uncontrolled trial). The rationale was multi-fold. Firstly, the researcher considered some of the criticism of randomised controlled trials, such as stringent inclusion criteria, rigid treatment conditions that introduce artificiality in research findings and make them difficult to apply and inform routine clinical practice (Eccles et al., 2003). Second, this subsection of the population is currently understudied. Thus, more evidence is needed to support the implementation of a randomised trial that is considered the gold standard for assessing the impact of psychological interventions in NICE guidelines (2014). As suggested by the literature, pilot studies and quasi-experimental designs are an excellent first step in preparation for conducting randomised controlled trials, as they allow researchers to optimise the intervention and obtain preliminary findings of its efficacy.

Thirdly, informed by ethical guidelines of not overburdening research participants needlessly, by avoiding randomisation, the researcher ensured that the study does not introduce yet another waiting-list in the timeline of bariatric surgery individuals. Individuals referred on the bariatric pathway have to meet several criteria to qualify for surgery, wait for the funding to be approved in addition to attending multiple appointments, assessments and interventions with a multidisciplinary team, the whole process currently spanning from six months to sometimes two years (Mahawar et al., 2015). As such, the researcher considered the strenuous process that individuals have to undergo prior to attending the intervention, the context of the world pandemic that introduced further delays in waiting times and, in the absence of any preliminary findings regarding the efficacy of such an intervention, decided against randomisation. Finally, the researcher also considered the doctoral thesis's time constraints and the study's feasibility in making this decision. Nonetheless, the researcher is aware of the limitations of a quasi-experimental design and that the lack of randomisation threatens internal validity and arguably raises questions about establishing causality as it increases the probability of other plausible hypotheses. To counter these potential weaknesses, the psychological assessment timepoint was included to check whether the impact of the passing of time alone led to changes in measures rather than the intervention. Furthermore, the qualitative strand of the research allowed for a more direct link to be made between any observed changes in scores and the

group intervention. Given that the present study aims to evaluate a brief CBT-informed intervention for MEPs in a pre-bariatric sample population, the repeated-measures design of the quantitative strand involved administering several psychological measures at three timepoints: psychological assessment, pre- and post-intervention.

A qualitative strand of the investigation was conducted post-intervention to capture participants' subjective experience of attending the brief CBT-informed group intervention for MEPs. For the qualitative strand of the mixed-method study, the researcher opted for thematic analysis (Braun & Clarke, 2006) as they considered it best suited for this study. In addition to exploring the subjective experience of attending the intervention, the qualitative strand further sought to identify areas of development, guiding researchers in improving the group intervention based on participants' feedback.

2.5 Part I- Quantitative strand: Using outcome measures to evaluate the brief CBT-informed group intervention for MEPs

To evaluate the brief CBT-informed group intervention for MEPs in a pre-bariatric sample, the researcher employed standardised measures at three timepoints for the quantitative part of the study. In the below subsections, the procedures for the quantitative strand of the intervention are outlined.

2.5.1 Sampling

2.5.1.1 Study sample

For this study, the researcher computed a priori sample size calculation for a repeated measure within factor ANOVA, using the Gpower software (Faul et al., 2007). For the power analysis calculation, the researcher calculated the a priori sample size using both a medium (h2 = 0.14) and large effect size (partialh2 = 0.14) and a Type I error probability of .05. These effect sizes were rendered by the literature of psychological interventions in bariatric populations, with studies varying in their reported power (Kalarchian et al., 2013; Liu, 2016). The analysis yielded that to meet these a priori conditions, the optimal number of participants needed for this study is between 18 (f=.40) and 43 (f=25). Therefore, the researcher recruited 44 participants for this study.

2.5.1.2 Sample inclusion and exclusion criteria

Participants were included if they were i) 18-years-of-age and up due to the age constraints of the bariatric service that serves adults only ii) on the waiting list to receive primary bariatric surgery iii) have been identified to have maladaptive eating patterns following psychological

assessment iv) and had access to the Internet and a phone/computer/tablet in order to access the intervention.

They were excluded if they i) were receiving other psychological intervention at the time of recruitment ii) had insufficient English language ability to take part in the group and complete questionnaires iii) had been identified to suffer from other significant psychiatric mental health problems requiring active treatment at psychological assessment timepoint. Due to a lack of funding for this study, the researcher could not include non-English speakers that required interpreters. Furthermore, due to the NICE guidelines criteria (2014) for bariatric surgery, vulnerable and at-risk participants were excluded from progression on the pathway and referred to appropriate services at psychological assessment timepoint.

2.5.2 Recruitment and research strategy

For this study, participants were recruited from the private psychological service contracted out by the North London NHS bariatric service. The private service provided psychological assessments and a brief CBT-informed group intervention for pre-bariatric surgery individuals on the pathway identified as having MEPs. The bariatric service covered all costs for the interventions offered by the private psychological service.

Individuals referred to the bariatric team prior to the pandemic completed in their first appointment the paper-based version of the Bulimic Investigatory Test, Edinburgh (BITE; Henderson & Freeman, 1987). During the pandemic, due to resource constraints, the use of the BITE measure was paused, and individuals were screened for unusual eating patterns during their first consultation with the bariatric team by their clinicians. Those that presented with unusual eating patterns at their appointment were further referred for a psychological assessment. For individuals that had completed the BITE measure at their appointment, only those that met the threshold for highly unusual eating patterns (and/or present with a prior/current mental health diagnosis) were further referred for a psychological assessment. Between September 2020 and June 2021, approximately 137 individuals were referred for a psychological assessment (33 did not attend).

All aforementioned individuals were invited to attend a psychological assessment carried out by one of the psychologists or trainees (researcher included) from the private psychological service. The week prior to their assessment, individuals were sent an email with information about the appointment and the link to complete a set of measures (TFEQ-R18V2; BES; PHQ-9, GAD-7; CIA) and demographic information online. They were advised to complete the measures prior to their appointment.

Following, individuals attended the assessment that lasted for approximately one hour and comprised a clinical interview that followed the Eating Disorder Examination (EDE-17) structure, which is considered a '*gold standard* ' measure of eating disorder pathology (Fairburn et al., 2008). In addition, current and past mental health history (risk included) were taken together with any intervention they received (e.g., medication, psychological intervention, counselling, self-help etc.).

Individuals that met the criteria for maladaptive eating patterns at the assessment timepoint were informed about the NICE guideline recommendations (2014) for bariatric surgery. The service drew the criteria for maladaptive eating patterns from the bariatric literature (Kalarchian et al., 2013; Liu, 2016; Avenell et al., 2004):

- Daily emotional grazing (snacking on small portions of food throughout the day) with or without meals being skipped and in the absence of other healthy emotional regulation strategies.
- Chronic and/or frequent comfort eating episodes (at least twice weekly) in response to distressing emotions in large quantities in the absence of other healthy emotional regulation strategies.
- Mild to moderate Binge Eating Disorder (BED) DSM-V criteria (2013).

All individuals with MEPs were offered information about the brief CBT-informed group intervention offered on the pathway, alongside the alternative of being referred by their GP to their local psychological services. Individuals that consented to the group intervention were added to the waiting list for the group intervention and informed that they would be contacted when a place became available for the intervention. Participants were informed that following their attendance of the group intervention, in accordance with the NICE guideline recommendations, the bariatric service required group facilitators to write a report summarising the reported changes participants made to their eating patterns and their scores on the outcome measures. They were informed that the final set of psychological recommendations made at the end of the group intervention were made with a view of ensuring each individual received the necessary support in order to obtain the best outcomes post-surgery. Participants were informed that the end of group report was one of the factors that the bariatric team considered when assessing whether they would progress each individual to surgery. Group facilitators made tailored recommendations for each individual attending the intervention based on their clinical observation, the participant's reports of changes made to their eating patterns and their scores on the outcome measures. These recommendations fitted mainly in the following categories:

- Recommendations for progression to surgery.
- Recommendations for a re-assessment following the group intervention to assess for changes and/or whether the improvements made were maintained over time (in the case of complex presentations).
- Recommendations for further external therapeutic input to address severe MEPs or mood disorders prior to progression on the pathway.

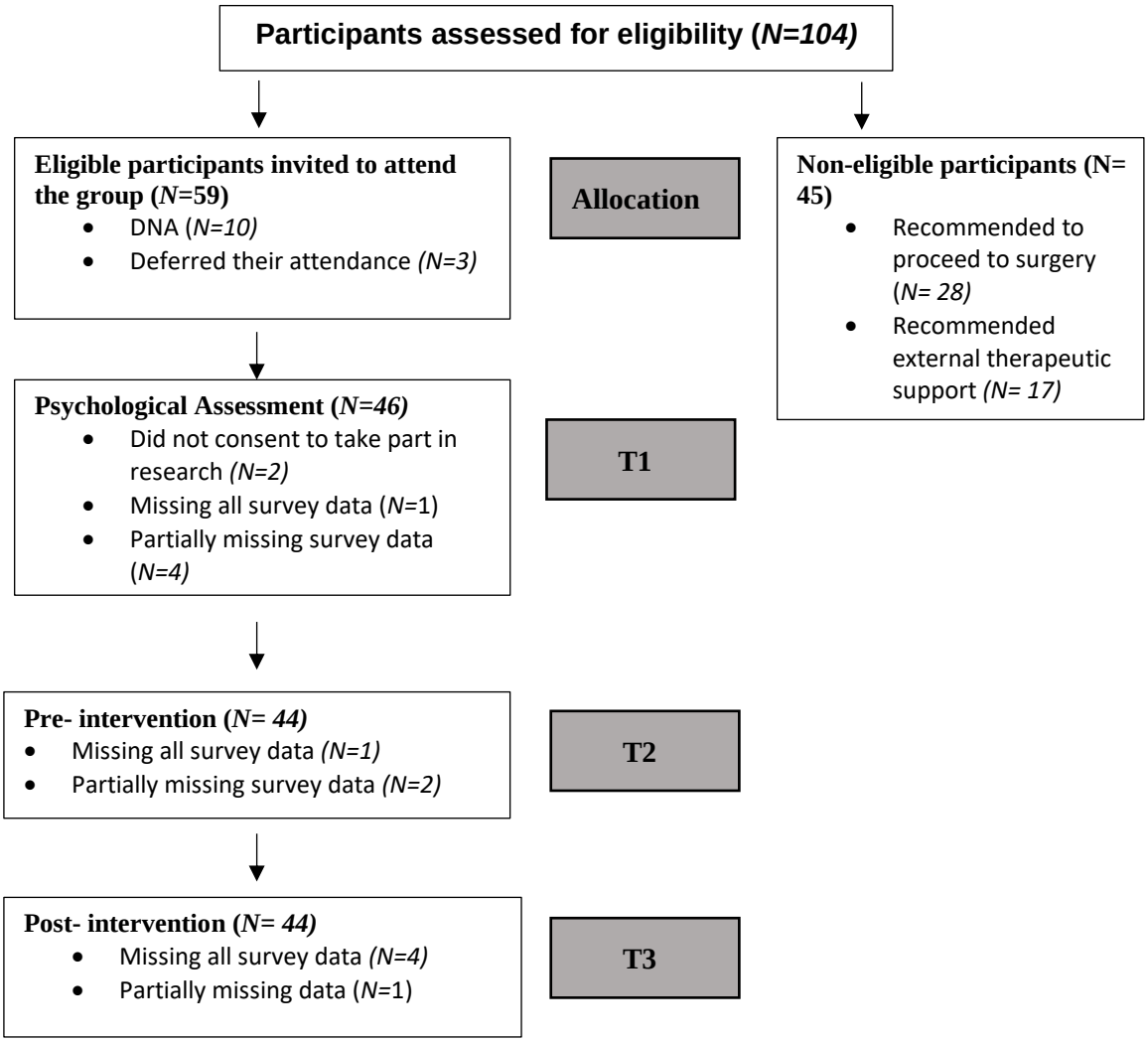
Around 43% (*N*= 59) of the 104 referrals resulted in recommendations for attending the group intervention (or given the option to be referred externally for support), 20.5% were recommended to proceed to surgery, 12.5% were recommended further therapeutic input or other interventions following assessment. The waiting times varied, as individuals had the option to defer their attendance to the group. On average, the waiting time between psychological assessment and receiving the group intervention was 18 weeks, except for two individuals deferring for one year due to personal circumstances. Following the group intervention, recommendations to the bariatric service were made for 80.5% of participants to progress on the pathway, 15% of participants to be booked for a re-assessment, and 4.5% of participants to be referred for further therapeutic input to address their MEPs or mood disorders.

2.5.2.1 Allocation to the group

Participants on the waiting list were contacted with dates and times when a space became available for the group intervention. Based on their availability, participants on the list were given the option to opt-in or defer to the subsequent group intervention. All participants (as seen in Figure 2.2) invited to attend the group were asked to attend a minimum of three out of four sessions. The brief CBT-informed group intervention for maladaptive eating patterns consisted of four standalone weekly sessions. No more than nine participants were included per cycle of intervention (Yalom & Leszcz, 2005) to accommodate the group intervention's online delivery due to the COVID-19 pandemic. The researcher collected data from seven cycles of the group intervention until the sample size was saturated. The groups varied in size and included between four to nine participants per cycle of intervention.

Figure 2.2

Participant flow through enrolment, allocation, pre- and post-intervention



2.5.3 Quantitative outcome measures

The researcher explored the potential for detecting a change in each of the following standardised questionnaires across the three timepoints.

2.5.3.1 Administration of Measures

The researcher collaborated with the clinicians involved in designing the intervention to select the below outcome measures for this study to ensure that the questionnaires selected matched the intended aims of the intervention. The BITE outcome measure was employed as a screening measure by the bariatric service and given that not all candidates completed the measure due to the COVID-19 pandemic, this was not included in the present study.

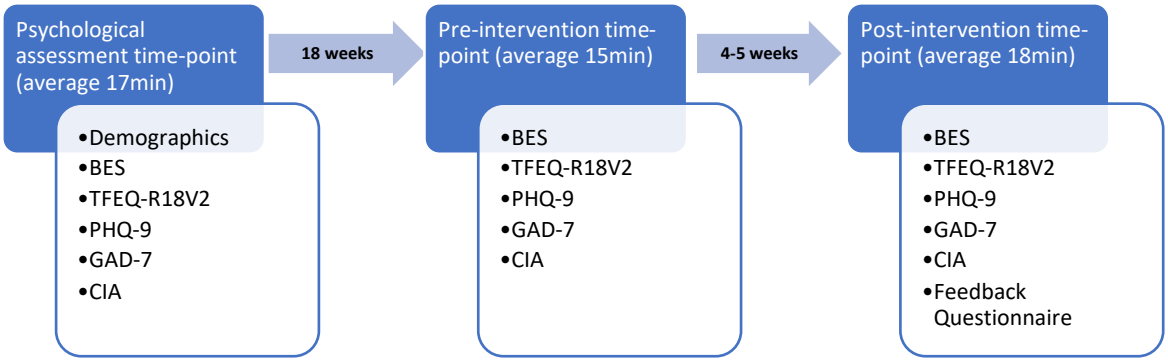
The researcher administered the following questionnaires: BES (Gormally et al., 1982), TFEQ-R18V2 (Cappelleri et al., 2009; Karlsson et al., 2000), CIA (Bohn et al., 2008), PHQ-9 (Kroenke et al., 2001) and GAD-7 (Kroenke et al., 2001). Participants completed all the above self-reported measures at psychological assessment timepoint, pre-intervention and at post-intervention timepoint, except for four individuals that were assessed prior to the introduction of the CIA-3.0 measure in the survey. Given the brevity of the group intervention that took place over four sessions within a time framework of 28-to-35 days (4-5 weeks), the researcher invited participants to complete the measures holding in mind their experience over the past 14 days in order to detect change at post-intervention. In addition, participants completed the demographic information at psychological assessment timepoint and a feedback questionnaire at post-intervention (Figure 2.3). The measures were completed via a survey hosted on Qualtrics, for participants' convenience and in compliance with COVID-19 pandemic regulation. Therefore, the paper-based questionnaire option was removed.

The measures and demographics at assessment timepoint took on average 17 minutes to complete by participants. At pre-intervention, the measures took on average 15 minutes, and at post-intervention, due to the additional Feedback questionnaire, the survey took on average 18 minutes for participants to complete. Participants were emailed the link to the survey containing the measures within the week prior to their psychological assessment. Participants completed the pre-intervention measures at the start of the group timepoint and the post-intervention measures at the end of the group or the week following the post-intervention (for those that did not attend the last session). At each timepoint, they were provided with the option to allow for the service to use their data for research, audit and service development purposes and publications. The Data Protection Officer provided the researcher only with the data from individuals that agreed for their information to be used for research purposes at each timepoint.

Demographic details: Self-reported details were collected for each participant on gender, age, ethnicity, employment status, level of education using a bespoke questionnaire.

Figure 2.3

Quantitative strand data collection timepoints with their ascribed measures and average completion times



2.5.3.2 Binge Eating Scale (BES)

The BES (Gormally et al., 1982) is a self-reporting 16-item scale that assesses the behavioural and emotional/cognitive symptoms associated with binge eating in people living in larger bodies (Appendix A). The questionnaire successfully discriminates among individuals living in larger bodies with either no, moderate, or severe binge eating problems. Each item on the BES scale comprises between three to four statements that are each rated on a scale of 0-3 (0 = indicates no binge eating problem; 3 = reflects severe binge eating problems).

The measure has been found to have high internal consistency (Kruskal-Wallis's X2=9.1, p<.01) and good test-rest reliability (r=.87, p<.001) (Timmerman, 1999). Although the BES was developed before the introduction of binge eating as a disorder, it has been shown to have good sensitivity and a good rapid screening measure for individuals living in larger bodies (Grupski et al., 2013). Moreover, in Grupski et al.'s (2013) study, the measure was used to screen for binge eating in bariatric surgery candidates. Their results suggested that a cut-off score of 17 was optimal and correctly classified 78% of the patients with binge eating disorder. This outcome measure was selected for the present study as it was found to be a simple, rapid, and robust measure for screening for binge eating that is particularly suited for discriminating in the population of interest in this study, individuals living in larger bodies on a bariatric pathway.

2.5.3.3 Three Factor Eating Questionnaire 18-item, version 2 (TFEQ-R18V2)

The TFEQ-R18V2 is an 18-item self-assessment measure designed to assess two behavioural and one cognitive domain of eating (Appendix B). This revised version of the measure was selected as it is more suited for use in epidemiological and clinical trials to

assess unusual eating patterns in overweight and normal populations (Cappelleri et al., 2009). The Cognitive Restraint factor comprised of three items (highest raw score 12) and looked at measuring the conscious restriction of food to promote and control weight. The Emotional Eating factor assessed for eating in response to emotions and comprised of six items (highest raw score 24). Lastly, the Uncontrollable Eating factor, comprised of nine items (highest score 36), assessed for the tendency to overeat due to loss of control. A four-point Likert scale is used to respond to each question (1-4) and calculate the raw scores for each subscale. The raw scores obtained by the participants are then transformed to scaled scores between 0-to-100 to facilitate comparison between the subscales and/or other measures. There are no cut-off scores for the different domains, with higher scores indicating more cognitive restraint, uncontrolled and emotional eating. However, as highlighted by the restraint theory, stringent attempts to control food/ weight/shape can cause episodic overeating/binge eating. The transdiagnostic model of eating disorder further proposes frequent dieting attempts as a cause of binge eating, with the restraint theory further suggesting it as a cause of obesity (Polivy & Herman, 2002). On the other hand, low cognitive restraint is indicative of a lack of control over food (Polivy & Herman, 1999) and is highly correlated with uncontrolled eating. Thus, for this study, scores in the moderate range for the Cognitive Restraint factor, lower to moderate range scores on the Uncontrolled Eating and Emotional Eating factors were considered indicative of a normal eating pattern.

The 18-item version showed a good comparative fit index of .96, with the Cronbach coefficient of 0.89 for the UE factor, 0.94 for the EE factor and 0.78 for the CR factor, for both clinical samples and web-based population (Cappelleri et al., 2009; Karlsson et al., 2000). The measure was selected to establish the cognitive restraint, emotional, and uncontrolled eating patterns of participants as these have been identified as components of maladaptive eating patterns by previous research (Polivy & Herman, 2002).

2.5.3.4 Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a brief nine-item measure of depression routinely used in research and clinical practice. Each item can be scored on a four-point Likert scale (from not at all to nearly every day). The PHQ-9 scores each of the nine DSM-V criteria upon which the diagnosis of depressive disorder is based (Appendix C). It has been found to have good psychometric properties, with high internal reliability as measured by the Cronbach's α (α = 0.89), and a good test-retest reliability of 0.84 (Kroenke et al., 2001). The scale has four categories of increasing severity, with scores below four indicating a minimal depression, from 5-9 of mild depression, 10-14 of moderate depression and 15-19 of moderately severe depression and above 20 of severe depression.

2.5.3.5 General Anxiety Disorder (GAD-7)

The GAD-7 is a seven-item self-assessment measure of general anxiety disorder. The items are rated on a 4-point Likert scale from 0 (Not at all) to 4 (Nearly every day). For specificity and sensitivity, a cut-off point of 10 helps identify cases of GAD (Appendix D). In addition, cut off points have been identified for levels of severity of anxiety, with scores up to five representing mild anxiety, 6-10 representing moderate anxiety, 10-15 representing moderately severe anxiety, whilst scores between 16-21 indicating severe general anxiety. In terms of the measure's psychometric properties, GAD-7 has been found to have excellent internal consistency (Cronbach a = .92) and good test-retest reliability (intra-class correlation = 0.83).

The PHQ-9 and GAD-7 have been selected as secondary outcome measures for their brevity, good sensitivity, and specificity (Kroenke et al., 2001; Spitzer et al., 2006); as prior literature suggests that there is a reciprocal relationship between maladaptive eating patterns and mood, whereby these are either triggered by an individual's low mood and/or are at the root of an individual's low mood (Mahawar et al., 2015).

2.5.3.6 The Clinical Impairment Assessment Questionnaire (CIA-3.0)

The CIA-3.0 version 3.0 (Bohn & Fairburn, 2008) is a self-reported measure of severity of psychosocial impairment due to eating disorder features comprising of 16-items (Appendix E). Each item is measured on a four-point Likert scale (0= Not at all; 1= A little; 2= Quite a Bit; 4= A lot), with a higher rating suggesting a higher level of impairment. The CIA-3.0 is a global measure of secondary psychosocial impairment, and as such, ratings on items are added together to obtain a final score. The range of scores an individual can obtain on the measure lies between 0-to-48, with a cut-off point of 16 that was found to be best at predicting eating disorder case status (Bohn et al., 2008). The measure covers impairment in cognitive functioning, work performance, interpersonal functioning and self-perception, domains that have been found to be typically affected in individuals suffering from eating disorders. The assessment was designed to be administered following a measure of eating disorder pathology before and after a clinical intervention, and it was found to be suited to epidemiological studies. The CIA-3.0 was selected for its specificity of assessing the secondary psychosocial impairments resulting from disordered eating features. The choice of not using an overall quality of life measure for individuals living in larger bodies was made because these measures captured a much broader range of experiences. Thus, changes across time-points would not necessarily be able to be attributed to the intervention that is being evaluated in the present study.

2.5.4 The brief CBT- informed group intervention for MEPs

The group protocol for the brief CBT- informed intervention for MEPs was developed based on the current NICE guidelines (2014) for the treatment of BED and research in MEPs (Avenell et al., 2004). The protocol was designed by two registered Counselling Psychologists working for the private psychological service, and it was commissioned by the bariatric service. The group intervention is underpinned by a cognitive behavioural theory and model (CBT) and its third wave approaches Dialectical Behavioural Therapy (Linehan, 2001; Telch et al., 2001), Compassion Focused Therapy (Gilbert, 2009). In designing the protocol, a review of the literature in the treatment interventions of binge eating was undertaken by the clinicians (Fairburn, 2008; Cooper et al., 2009; Safer et al., 2009; Sandoz et al., 2011). The clinicians further looked into the weight management literature for uncontrolled and emotional eating interventions (Avenell et al., 2004).

Moreover, the literature on psychological interventions in the pre-bariatric population was reviewed (Liu, 2016; Kalarchian et al., 2015). In creating the protocol, the clinicians adhered to the existing guidance in developing and evaluating complex interventions (Medical Research Council, 2019). The group was delivered either by two qualified Counselling Psychologists or by one qualified psychologist and a trainee psychologist. The researcher was not involved in the implementation of the intervention, rather in its evaluation.

The brief CBT-informed group protocol for MEPs is comprised of four standalone online weekly sessions lasting 90 min (+20-30min for the measures). A brief description of the protocol with the associated cognitive and behaviour change techniques can be found in the table below. Each session contains psychoeducational material and skills training. The sessions aim at incorporating a variety of cognitive (pros and cons list, challenging thoughts) and behaviour change techniques underpinned by different mechanisms of actions (e.g., goal setting, planning, feedback and monitoring, alternative rewards/behaviours etc.) to increase the likelihood of behaviour change (Mitchie et al., 2018). The main aim of the intervention was to help participants change their relationship to food and eating, allowing them to acquire new coping skills to manage distressing emotions. In each session, participants were offered handouts of the group protocol and the homework, alongside psychoeducational leaflets on the different skills learnt. In addition, there were opportunities in each session for group discussions, in-vivo skills practice, joint planning, and problem-solving. The participants were asked to inform the group facilitators when unable to attend sessions.

Table 2.1

Brief CBT-informed intervention for maladaptive eating patterns outline

	Components	Behaviour Change Techniques and Mechanisms of change
Session 1	• Introduction • Confidentiality and group agreement • Aims – course outline • What is Binge Eating? • What is Emotional/Uncontrolled Eating? • How does Binge Eating develop and how it is maintained? • The pros and cons of change • Self-monitoring • Set homework	- Commitment and group contract. - Psychoeducation- information about BED and Emotional Eating/Uncontrolled eating - Motivation and readiness for change. - Cognitive restructuring: all or nothing thinking. - Goal setting. - Self-monitoring and instructions- food diaries with (food eaten, mood, circumstances with/without people). - Letter writing to the friend /enemy part of the maladaptive eating pattern.
Session 2	• Review previous session content • Reflect on letter writing and self-monitoring, feedback to the group • Introduce regular eating pre- and post-surgery • Psychological and physiological causes of Binge Eating • Psychological and physiological causes of emotional/uncontrolled eating • Goal setting	- Review of behaviour/outcome goals; discrepancy between current behaviour and goal setting. - Reviewing instructions for self-monitoring. - Introduction of regular eating pattern now and after bariatric surgery: formulation of BED/EE/UE, Energy graph, triggers etc. - Psychoeducation about normal eating and food. - Problem solving barriers to implementing regular eating patterns (unplanned eating, social meals etc.), how to change. - Cognitive restructuring: all or nothing thinking. - Restructuring of the physical/social environment: giving participants information about how they can change their environment to promote changes in eating patterns such as: planned shopping list, eating only at dinner table, throwing/freezing extra portions etc. - Behaviour practice/ planning e.g., HALT acronym: Hungry? Anxious/Angry? Lonely? Tired? - Goal setting. - Homework- implementing regular eating patterns, planning meals/snacks, food diaries.
Session 3	• Review previous session content • Reflect on regular eating in pairs, feedback in the group • How dieting increases cravings • Understanding cravings • Alternatives to maladaptive eating patterns • Binge/maladaptive postponement trials • Alternative “cookie jar” • Breathing/mindfulness/relaxation	- Review of behaviour/outcome goals; discrepancy between current behaviour and goal, goal setting. - Normalization of barriers- highlighting common barriers in implementing regular eating patterns. - Setting new goals - Cognitive re-structuring of unhelpful rules and beliefs about eating - Psychoeducation about impact of emotions on cravings etc. - Engendering acceptance/tolerance of cravings, de-fusion from unhelpful thoughts - Learning alternative coping strategies to emotional distress: cookie jar, HALT acronym, surfing the urge of binge eating/emotional eating etc. - Graded behaviour – binge postponement trial 10 to 20 to 30 minutes - Soothing-breathing practice - Mindfulness: leaves on a stream, mindfulness of eating - Progressive muscle relaxation
Session 4	• Review previous session content • Reflect on binge postponement trials and alternatives to binging in pairs, feedback to the group • Self-Compassion • Body image • Preparing for Surgery • Feedback	- Review of behaviour/outcome goals; discrepancy between current behaviour and goal, goal setting. - Normalising barriers to implementing alternative activities - Problem solving barriers - Managing slip ups/setbacks - Self-compassionate self-talk - Skills practice - Body image: development and maintenance of poor body image, consequences, and ways to improve it: perceptions of errors, interpretation errors etc. - Building a compassionate body image - Video exposure - Managing post-surgery expectations - Relapse prevention

2.5.5 Data Analyses

All data in the quantitative strand was analysed using IBM SPSS Version 26 software for Mac. For significant results to be detected an alpha level of $p < .05$ was set. The scores for questionnaires were calculated as described in the above section, with reverse coding being applied wherever relevant. The researcher screened the data by observing the ranges of scores obtained by participants on each measure, prior to data entry and analysis to check for erroneous entries.

2.5.6 Missing data

The researcher followed the best practice recommendations (Schlomer et al., 2010) of reporting missing data to understand results better. For this study, the survey was hosted on Qualtrics software (2015) that provided benefits in the completion of the measures. For the Demographics and Feedback Questionnaire, participants had the option to proceed without completing all items, although uncompleted items were highlighted to them. However, given the double fold use of the quantitative measures (report writing and research), the service implemented a forced entry option to complete the questionnaires. Nonetheless, not all participants completed the survey at each timepoint or in its entirety (see Figure 2.2), with three participants starting the intervention but deferring for the subsequent available group intervention due to personal circumstances (e.g., work-related, family-related difficulties).

2.5.7 Outlier analysis

To ensure the robustness of the data analyses, the data were screened for both univariate and multivariate outliers. The screening procedures and treatment of outliers will be described in the following chapter.

2.5.8 Main Analyses

Exploratory demographics analyses were conducted on the data set to contextualise the current research findings. Furthermore, correlations between the measures and their subscales were computed. Following the preparation of the data set, the researcher planned to undertake doubly multivariate MANOVAs to test the two main hypotheses of the study, regarding changes in participants' MEPs and Wellbeing across time. Repeated measure ANOVAs for each sub-hypothesis were planned (SPSS version 26) to identify differences across the three timepoints: psychological assessment, pre- and post-intervention. Trends identified were reported. Friedman's tests were undertaken where data was not normally distributed. Assumption testing was conducted and reported prior to embarking on main analyses.

2.6. Part II Qualitative Study- Using semi-structured interviews/feedback questionnaires to explore the subjective experience of participants about the brief CBT-informed group intervention for MEPs

2.6.1 Rationale for Thematic Analysis

For the qualitative strand of this study, the researcher elected to employ Thematic Analysis (TA). TA was the chosen research method for this strand of the study as it was aligned with its ontological, epistemological, and methodological position. TA is a theoretically flexible approach compatible with both realism and constructionist paradigms, and that is wildly used in mixed methods designs to analyse qualitative data (Creswell, 2013; Braun & Clarke, 2006). TA is a research method that identifies, analyses and reports patterns within a data set (Braun and Clark, 2006) whilst also arguably interpreting the findings (Boyatiz, 1998). In order for these themes to be representative of the phenomenon/topic described (Boyatiz,1998; Braun & Clarke, 2006), they need to be grounded in the data, logically deriving from it and substantial. Whilst TA is widely used, it has only recently gained recognition as a qualitative method of analysis (Braun and Clarke, 2006). Braun and Clarke identified in their seminal paper different orientations in TA based on whether the researchers want a rich account of the whole data set or just of one particular aspect of it (critical realist/constructionist); whether they are guided by a theoretical framework (inductive/deductive) and lastly, whether themes are identified at a semantic level or an interpretative/latent level (Boyatzis, 1998).

Braun and Clarke (2006) have further outlined a rigorous, multi-stepped process of data analysis. For this study, the researcher employed a critical realist, inductive and semantic TA analysis to help identify themes regarding the experience participants had of the group intervention. This particular approach was used, as it allowed the researcher to be data-driven and identify and describe explicit themes across the whole data set in order to respond to the research question and corroborate quantitative findings. Furthermore, this type of TA was aligned to the philosophical underpinnings outlined in the above sections of this study.

The flexibility offered by TA has allowed it to be creatively used across various applied sciences such as educational, social, behavioural and, more recently, psychological fields (Braun & Clarke 2006). TA has also been used within service-user led research (Joffe, 2012), helping to increase evidence-based and representation of the voice of service-users in research, which made it relevant to the scope of this study. Nonetheless, its flexibility has also raised concerns regarding its coherence and consistency in research (Holloway &

Todress, 2003). As such, the reporting of themes across a data set may inadvertently generalise the experience of some but not all individual participants, silencing some voices that may bear relevance to the research topic. Further problems may arise whereby contradictory themes may be identified at an individual level, thus impacting the continuity of the data set (Braun & Clarke, 2013). To mitigate this criticism, Braun and Clarke devised a multistep process of analysis and of reporting the analytic process within research articles.

Furthermore, the qualitative nature of TA is bound to the subjective interpretation of themes by the researcher, which raises concerns about whether the research findings are rooted in the data set. Thus, researchers have been encouraged to provide clear examples of their analytical process referencing the transcript. TA further requires a level of homogeneity in the sample population. For example, it was considered that whilst participants' subjective experiences of their relationship with food may have been different, all participants shared the experience of having a maladaptive eating pattern. Thus, the sample was considered homogenous regarding “factors relating to key elements of experience” (Braun and Clarke, 2013, p181).

2.6.2 Critical consideration of other qualitative methodologies

The researcher considered whether the research question could have been approached better using different methodologies, such as Interpretative Phenomenological Analysis (IPA; Smith et al., 1999) or Grounded Theory (Glaser, 2007). Both IPA and Grounded Theory are, however, theoretically bounded. IPA takes a phenomenological epistemology, giving experience primacy and looking to capture in rich detail an understanding of an individual's experience to gain insight into the topic researched (Smith & Shinebourne, 2012). IPA interprets data in an inductive, double hermeneutics process and is mainly employed by answering a broad set of questions of the phenomenon in question. Mostly, IPA research tends to capture the experience of individuals around a significant life event that may have implications for their identity (Braun & Clarke, 2013). Thus, given IPA's phenomenological and interpretative nature, which looks to capture richness and depth information, it was not considered to be aligned with the current research question and/or purposes seeking to capture the overall experience of participants of the group intervention by using specific questions. Furthermore, given that IPA as a method and methodology imposes more structure and guidance in its application, from question development to analysis, it was not found to meet the flexibility needed in answering the research questions within a mixed-method design.

Regarding Grounded Theory, which seeks to generate a theory on a particular phenomenon

from a data set (Charmaz, 2000), this was not aligned with the aims of this mixed study. The current research sought to identify overarching themes about the experiences participants had of attending/delivering the intervention that could help corroborate the findings from the quantitative strand rather than identify an emergent theory. GT also takes a constructivist stance (Charmaz, 2000), which is not aligned to this study's pragmatic, critical-realist stance. Thus, GT was considered incompatible with the research aims and its design. Therefore, TA was chosen as the preferred method of analysis, allowing the researcher to meet the qualitative aims of this study. Furthermore, TA was found to be the preferred method of analysis within the field of mixed-method research due to its flexibility and a-theoretical framework (Creswell & Plano Clark, 2018).

2.6.3 Sampling

2.6.3.1 Qualitative strand sample

Clarke and Braun (2013) suggest that for a doctoral thesis, ten interviews would be considered an optimum number for TA. Furthermore, Chambless et al. (1996) suggest that a sample of nine case studies would be sufficient in establishing the efficacy of an intervention.

However, given the mixed-method design of this study, the additional TA of feedback questionnaires received from group participants, and the time constraints of the doctoral thesis, the researcher aimed at recruiting an overall sample of four participants for the semi-structured interviews. Therefore, a purposive sampling method (Patton, 1990) was used for the recruitment of participants, which allows for a homogenous sample of the target population in line with the TA requirements.

2.6.3.2 Sample inclusion criteria

In addition to meeting the inclusion and exclusion criteria from the quantitative strand of this study, participants had to meet the following inclusion criteria: *i)* individuals had attended at least three out of the four group intervention sessions for MEPs between September 2020 and June 2021.

2.6.4 Recruitment

The researcher approached participants in the first and/or last online session of each cycle of the group intervention, about taking part in the semi-structured interview looking at their experience of the group. The researcher outlined the purpose of the qualitative strand of the study, provided with the information leaflet and answered questions and queries participants had regarding the research. The researcher asked individuals attending the group for their

consent to email them the participant information leaflet with the researcher's contact details. All participants approached agreed to the email, and the researcher further emailed them the information. Five group participants out of 44 volunteered to take part in the qualitative strand of the intervention. Prior to the interview, the researcher emailed them with the consent form. All group participants who volunteered for the Qualitative strand signed and returned the consent form via email to the researcher prior to the semi-structured interview being conducted. One interview from a group participant (male) was excluded from the analysis (25min long) following discussions with the research supervisor, due to the participant's limited English language comprehension skills, which were unfortunately not detected at the psychological assessment timepoint. The participant reported having been able to understand and benefit from the individual psychological assessment; however, they reported to have found the content of the online group intervention hard to comprehend. They listed several difficulties they had with understanding the content and aim of the group intervention: the different English accents of other group participants, technical difficulties with the stability of their internet connection which caused audio delays and overlaps between participants speaking, background noise and or echo due to other participants not muting themselves, interruptions of the facilitators' presentation by participants, difficulties in asking clarifying questions during the group intervention etc. As a result, the participant was unable to fully understand the aim and content of the group intervention, which meant that it was not possible to use the qualitative data from the interview to respond to the research questions. Nonetheless, the participant's contribution to the research study generated recommendations for service development, as well as clinical and research implications that will be detailed in the Discussion chapter. The rest of the four participants that were interviewed had attended the group intervention in its entirety.

2.6.5 Qualitative measures

2.6.5.1 Feedback Questionnaire

The feedback questionnaire (Appendix F) comprised of 10 questions. The first seven open-end questions look to capture the participant's experience: perceived usefulness, self-reported adherence, satisfaction with the group protocol and facilitators. Furthermore, it invited participants to make suggestions for improvement or changes. The final three questions were rated on a five-point Likert scale and aimed at capturing: participants' self-report adherence to the group intervention, whether they would recommend the group to others, their overall perception of the group's helpfulness as well as suggestions for improvements. The questionnaire was designed following the recommendation from the literature regarding the use of qualitative research in evaluating psychosocial interventions (O'Cathain et al., 2015).

2.6.5.2 Semi-structured interview designs

The researcher created a semi-structured interview agenda (Appendix G) to capture the subjective experience of participants of the brief CBT-informed group intervention for MEPs. The semi-structured interviews for participants covered five sections with associated prompts/questions:

1. The overall experience of the group intervention.
2. Feedback on the content of the group intervention (relevant/irrelevant; fidelity of the intervention delivery, etc.)
3. Perceived impact of the group intervention on participants' relationship with food/eating.
4. Feedback on the structure/format of the intervention (group vs individual; online vs face-to-face etc.).
5. Suggestions for improvements/changes to the group intervention and additional comments.

The agenda items for the semi-structured interviews were developed by following the recommendations for improving the quality and fidelity of interventions (Gearing et al., 2011) and maximising the impact of pilot studies through qualitative research (O'Cathain et al., 2015). The participants' interview aimed at providing them with the opportunity to respond and expand on their answers from the feedback questionnaire. Furthermore, the perceived usefulness of the group was explored, which allowed participants to highlight helpful or unhelpful aspects of the group and make suggestions for future improvements.

2.6.6 Research strategy

2.6.6.1 Semi-structured interviews

Interviews were conducted online on the Zoom software provided by City University for students. Interviews were arranged at a suitable time suggested by the participants. Participants were asked to allow for up to 60 minutes for their interviews. In the first 10-15 minutes prior to the interview, the researcher reiterated the complete information about the study and allowed participants to raise concerns and/or ask questions. Issues regarding confidentiality were explained, and they were again given the opportunity to consider whether they wanted to participate in this study.

The interviews were conducted using the semi-structured interview schedule described in the above section (Appendix G). However, this was used flexibly to foster a collaborative and informal atmosphere that could facilitate the exploration of participants experiences of

attending the CBT-informed group intervention for MEPs. The interview schedule was refined following each interview when deemed necessary and appropriate, in consultation with the research supervisor. Interviews lasted between 20-45 minutes, with an average of 30 minutes, and were audio-recorded using the online software used for the interview (Zoom). During the interview, the researcher took notes to capture context or reflections.

Following each interview, the researcher used a diary to record reflections of the interview and issues surrounding process, content and setting to help enhance reflexivity. The software's transcription tool used for recording was also used to download a time-stamped transcription of the interviews. Furthermore, for accuracy purposes, the researcher listened to the recordings and verified the transcripts, modifying as necessary and adding the notes taken during the interview to avoid losing context.

2.6.6.2 Feedback Questionnaires

At the post-intervention timepoint, all participants that attended three out of the four group sessions completed the survey that included the Feedback Questionnaire. 40 out of 44 participants completed the feedback questionnaire with qualitative information, 40 out of 44 participants completed the Likert scale questions of the feedback questionnaire, and 4 participants did not complete the feedback questionnaire. All data were downloaded separately for each participant for the purpose of the data analysis.

2.6.7 Data analysis

As highlighted earlier in this chapter, the qualitative data from the feedback questionnaire and the semi-structured interviews were analysed using thematic analysis (Braun & Clarke, 2006), and the principal themes that emerged helped identify the behaviour change techniques that participants found most helpful, feasibility issues, or suggestions for group development as well as the suitability of the measures.

An inductive ‘bottom-up’ approach to identifying themes and patterns was taken for this study, whereby the researcher did not try to fit the data to prior theory or coding frames but rather let themes and codes emerge from the data. The data was analysed at a semantic, explicit level using the six steps model suggested by Braun and Clarke (2006), whereby the researcher did not attempt to infer latent meanings but rather to identify patterns in the semantic content and look at their broader implications and meaning (Boyatzis, 1998). Based on the themes identified, the researcher aimed at informing the intervention and changing, as appropriate, its content and/or outcomes.

2.6.7.1 Thematic Analysis Procedure

2.6.7.1.1 Familiarisation with the data

In this analysis stage, the researcher immersed themselves in the transcripts and feedback questionnaires to become familiarised with the content by reading and re-reading the data set. Due to the inductive approach taken in the thematic analysis, the themes emerging from the data were strongly linked to the raw data and not to prior theories or research.

2.6.7.1.2 Coding

Following the familiarisation phase, the researcher generated codes from the data set identifying salient features relevant to the research question. The process consisted of writing the codes next to each paragraph in the transcripts. At this stage, the rich content of the dataset was organised into basic segments of raw information that were considered relevant to the aim of the research.

2.6.7.1.3 Initial themes

In this phase, the codes that emerged were collated, and salient patterns of meaning were identified as candidate themes. Visual representations were used to enable the researcher to combine the codes into salient themes, with thematic maps being drawn and revisited. This enabled a cohesive understanding of each arising theme. At the level of each master theme, sub-themes were identified that helped encapsulate the rich content of the data set.

2.6.7.1.4 Reviewing themes

Following the identification of potential themes, the researcher checked them against the data set, combined, discarded, or refined them to ensure that these are compelling, logically derived from the data whilst also answering the research question looking at capturing the experience that participants had of the group intervention.

2.6.7.1.5 Defining and naming the themes

At this analysis stage, the researcher mapped the detailed process of how each theme emerged from the data set and gave each a relevant name in line with the research question. Furthermore, each sub-theme was named to represent the raw content sitting underneath it in relation to both the master theme and research question.

2.6.7.1.6 Write up

In the last stage, the researcher linked the data extracts, codes, and themes into a narrative. Furthermore, they contextualised the qualitative findings with the quantitative findings of this study and the wider literature on the experience of individuals attending a pre-bariatric psychological intervention.

2.6.8 Fidelity and trustworthiness of findings

Within quantitative research more traditional psychometric criteria can be applied to evaluate the validity and reliability of research findings. However, these criteria are not easily applicable to qualitative research (Barker et al., 2005). To mitigate these drawbacks, the term 'trustworthiness' was applied to qualitative research findings encouraging researchers to provide clear guidelines for replication of the study, demonstrate transparency of thematic analysis and procedures that could make them verifiable by an independent assessor, and to outline a clear presentation of findings (Yardley, 2008; Williams & Morrow, 2009). Furthermore, some authors suggested reflexivity to be important in the analytical procedure and that the researcher make their theoretical orientation explicit (Altheide & Johnson, 1994). Therefore, these elements were undertaken for the qualitative strand of this study.

A critical realist approach to the data was taken in line with the research's ontological and epistemological position. The pragmatic, critical realist approach does not presume a solely unidirectional relationship exists between language, experience and meaning-making (Potter & Wetherell, 1987), acknowledging the context in which these are produced, and that experience may not be fully known to the researcher through the use of language. Therefore, the researcher's, epistemological and ontological positioning was explicitly outlined, and steps were taken to minimise bias of research findings:

- The researcher kept a reflexive diary in which they acknowledged their pre-existent biases.
- Each theme was underpinned by data extracts and verbatim quotes to define it.
- To check for consistency across transcripts, the research supervisor reviewed the analytical procedure (coding and themes of individual transcripts).

2.7 Ethical Considerations

For this study, the researcher adhered to the current professional and ethical guidelines relevant to Counselling Psychologists, such as BPS (2014). For the qualitative strand of the intervention, the researcher sought and was granted ethical approval by the Research Ethics Committee in City University. Relevant documentation is provided in Appendix H. In addition, this study was designed in accordance with the British Psychological Society's Code of Conduct (BPS, 2004), Ethical Principles and Guidelines for conducting research using human participants and the Good Practice Guidelines for the conduct of psychological research (BPS, 2004).

2.7.1 Informed Consent

At the point of recruitment, participants were informed of the overall aim of the study and were given information sheets (Appendix I) with contact details of the researcher. At the point of signing the consent form (Appendix J), they were informed that their participation was voluntary, they were free to withdraw whenever they wanted from the study without giving reasons, and that they could request their data to be removed from the study up to the point of data analysis. Furthermore, they were briefed that their participation/refusal/withdrawal will not affect their regular care in the bariatric service. Prior to taking part in the interviews, the researcher obtained the informed consent of participants.

2.7.2 Confidentiality

Furthermore, participants were guaranteed anonymity and informed that their data would be encrypted and securely stored on OneDrive City University. Participants were debriefed at the end of their participation in the study (Appendix K). The individual interviews were recorded using an encrypted device and/or the online Zoom software on which interviews were held. Data was immediately transferred onto the researcher's university One Drive storage, which is password protected. It is important to note the researcher's role within the service context. As a trainee counselling psychologist on placement within the organisation providing the psychological services on the bariatric pathway, the researcher was known to some participants from their psychological assessment timepoint. However, the researcher did not provide the group intervention, rather collected the data, and conducted the individual interviews.

The private psychological service was the data controller of the information needed for the quantitative strand. Thus, approval for this study was sought from the service, and it was granted. The researcher set up the online data collection of the measures they required from individuals on the bariatric pathway for their research. The private psychological service established that they wanted to be the data controller of the online data collection for the purpose of their ongoing research, audit, and service development. As such, the researcher further liaised with the Freedom of Information department from City University and the Data Protection Officer of the private psychological service for permission to use secondary data safely. The researcher further liaised with the service's Data Protection Officer for the implementation of the guidelines highlighted by the FOI department of the university (detailed privacy notice outlining how participants' sensitive data will be used according to the GDPR guidelines, consent being sought from participants when completing the measures, DPO sending anonymised data from consenting participants to the researcher, researcher further anonymising data where risks of identifying participants might still exist, e.g. only one

unemployed participant in the data set etc.). Once these measures were implemented, the secondary data was considered safe to use for research purposes by the researcher, and they did not need to seek ethics approval from the City University Ethics Board for the quantitative strand of this research study.

2.7.3 Risk Mitigation

Regarding the individual interviews, the researcher designed the study to produce minimal risks of harm to participants. Furthermore, Birch and Miller's study (2000) suggested that participants found the process of reflecting on their experiences therapeutic. Nonetheless, the researcher is aware of the pervasiveness of weight stigma and that enquiries about maladaptive eating patterns may lead participants to become distressed during the interviews. Therefore, the researcher clarified their role at the beginning of the interview to the participants as a researcher rather than a clinician. Furthermore, for any risk issues highlighted during the interview process, the researcher made sure that their research supervisor was available so that concerns may be addressed ethically whilst attending to the duty of care of the researcher. In preparation for the qualitative strand, the researcher further considered alternative services (e.g., referral to local mental health psychological services) in discussion with the research supervisor. However, none of the participants required these. Whilst acknowledging the potential distress some participants may experience, this study aimed to give a voice to service users in shaping the content/structure of the intervention and providing an opportunity for professionals on the bariatric pathway to understand their experiences better.

2.7.4 Emotional Distress

To ensure that the researcher was protected against psychological distress from conducting the study, they accessed personal therapy, research group and used supervision to discuss issues. In addition, all participants were debriefed following their interview (Appendix K)

2.8 Reflexivity

Within the social sciences field, reflexivity has played a critical role predominantly in qualitative studies, guiding researchers to bracket their assumptions, preconceptions, and biases throughout the research process (Ponterotto, 2005). On the other hand, in quantitative studies, reflexivity has seldomly been considered necessary within a positivist worldview (Creswell, 2013). Nonetheless, the Michelson-Morley experiment suggested that as long as scientists are part of the research study, they cannot, by virtue of being part of it, draw absolute conclusions or hold completely unbiased interpretations of their results (Steindhart, 1991). As such, within this post-positivist stance, the value of reflexivity is acknowledged in quantitative

research design, analysis, and data interpretation. Below are some of my reflections on how reflexivity has played a critical role in this mixed methods research.

I came to this study from a passion for working with people who experience stigma and/or eating disorders, having myself experienced their impact personally and professionally. Nonetheless, I am aware as a researcher that I do not have a personal experience of living in a larger body and thus may have blind spots and biases that may permeate the research. Given the personal experience and blind spots that I bring to the study, I drew on reflexivity skills and held a research journal to help bracket my views and avoid biasing, to the best of my abilities, both the quantitative and qualitative strands of research. However, given the pragmatic worldview taken in this study, I remain reflective of my part as an active agent in shaping the research project and that impartiality cannot fully be achieved.

I began this research study with a certain naiveté, thinking that I could simply overcome the underlying tensions sitting at the core of my profession, Counselling Psychology. I believed that I could reconcile my humanistic perspective with that of the scientist-practitioner seamlessly. I began my journey into this research wearing a scientist-practitioner hat embracing a positivist worldview whilst reading the literature into the bariatric field, and thus not questioning enough its underlying tenets and research findings. For example, I subscribed to the view of obesity being a global epidemic and colluded with the medical model of illness whilst not overtly wanting to support this. Moreover, whilst I questioned the use of weight as the only primary outcome measure for most research studies in the pre-bariatric psychology literature, I was not opposed to using it in my study.

Nonetheless, my humanistic side and that of a social justice activist felt uneasy in the language I was using to describe people living in larger bodies and the lack of research representing their voices. I became interested in hearing the voice of the people I wanted to help through my research and discovered a weight inclusive approach to health. This led to a significant shift in my worldview halfway through the research process, which contributed to my transition from a weight normative researcher to a weight inclusive researcher.

I began questioning my beliefs and assumptions and started working with my fat biases. Whilst I can acknowledge that the work is not yet complete, to the best of my ability, I attempted for my study not to contribute to the negative portrayal of people living in larger bodies. Unfortunately, given the late point in the study at which my shift to a weight inclusive framework took place, I was no longer able to fully translate this into the study by adopting a transformational design to reflect my transformational worldview. However, within the pragmatic worldview of the study, I adopted a transformational lens using feminist and social

justice values to critique the literature and re-design the study. In the first instance, this led to a re-reading of the literature that inspired the removal of weight as an outcome measure in the evaluation of the intervention. Furthermore, a critical lens to the weight normative literature was provided in the literature review, and a plan was drawn out to use the research themes to inform the development of the intervention and the services involved in the care of candidates to bariatric surgery.

In addition, I reflected on the potential constraint that participants may feel in reporting positive experiences on outcome measures to enable their progression on the bariatric pathway. This would thus mask to a degree (due to the use of standardised measures) their experience or costs/benefits of the actual intervention and/or any suggestions for change in the intervention. This reflexive process led to changes to the Qualitative strand of the research project. A semi-structured qualitative interview was added alongside the open-ended Feedback Questionnaire looking to capture the participants' experience of the intervention. Furthermore, equal weight was then given to the quantitative and qualitative strands of research with the hope of giving voice to the experiences of people living in larger bodies.

To minimise the power imbalance and the potential coercive impact the clinical reports might have on participants responses, all participants were informed that their feedback and suggestions for improvements would be anonymously shared with the services involved in their care for service improvement. They were also informed that their participation in the research will remain confidential to both services and facilitators and that it will not influence the care they receive on the bariatric pathway. This information was explicitly provided to participants at both recruitment timepoint and prior to signing the consent form in order to ensure that all participants felt able to share their views about the intervention as freely as possible. Furthermore, all the participants in the qualitative strand were openly encouraged to talk during the interview about the difficulties they had with the group intervention (content, facilitation, timings, length etc.). Whilst, I ensured to mitigate for demand characteristics, I remain reflective of the power imbalance created by the gatekeeping role of the psychological service and how this may have interfered with participants' ability to express themselves uninhibitedly. It is possible that participants may have sought to *please* me by making positive comments regarding the impact of the intervention, as they may have thought this will contribute to ensuring their progression to bariatric surgery.

Moreover, I remain reflexive of how my dual role in the research process (both as a clinician and as a researcher), specifically when conducting the semi-structured interviews with participants that I have previously assessed, may have influenced the conduct of participants.

Whilst, I did not personally facilitate the groups (to reduce the researcher bias factor), I acknowledged the risk of confusion about my dual role as clinician and researcher. To mitigate this risk, I reiterated to participants both at the consent and interview stages about my role in the process.

Furthermore, I remain reflective of my active role in shaping the research project and findings, specifically, for the qualitative part of the intervention. I acknowledged the lack of clear guidance on the role of reflexivity in TA (Braun & Clarke, 2006) and am aware of my active role in identifying themes and patterns that emerged from the data. By remaining open to how my gender, culture and dual role may have shaped my views and influenced the research project, I considered and reflected on how this may have contributed to identifying certain themes in feedback questionnaires and interviews. To address these potential biases, I ensured transparency in the data analysis by keeping a log of my assumptions and actions within the research project, as well as a reflective research diary as suggested by literature (Smith et al., 2009).

As previously mentioned in the chapter, one of the research interviews was omitted from analysis. Unfortunately, due to the participant's limited English language comprehension skills, they were unable to respond to the questions relevant to the aim of the study. Nonetheless, whilst it was not possible to use the interview in the analysis, the participant's contribution to the research project had a significant impact in informing service development and making recommendations for future research and clinical practice. These were included in the Discussion chapter. Upon reflection, this process allowed me to appreciate the value of each individual contribution in building a research project and informing service recommendations. In addition, it further highlighted the importance and power of mixed-methods studies in improving psychological interventions and generating clinical and research implications.

2.9 Summary

This chapter outlined the rationale for a mixed-methods design in addressing the research questions. It explored the pragmatic theoretical stance utilised in this study. Furthermore, the recruitment and research strategy, measures, data collection, and analytic procedures were presented for the study's quantitative and qualitative strands. Finally, an account of ethical considerations was provided alongside an exploration of the role of reflexivity in undertaking this research study.

Chapter 3: Results

The data for the quantitative and qualitative strands of this study were gathered concurrently. As highlighted in the above chapter, integration occurred at the interpretation point of the research (Hanson et al., 2005).

3.1 Quantitative strand analyses

The Qualtrics data collected from participants was imported to IBM SPSS Statistics 26. A missing value analysis was conducted, and 6% of data was found missing overall, with no patterns found in the missing values. Due to the forced entry option being enforced on the questionnaires, the missing data represents participants not completing the entire questionnaire rather than missing values on some of the questions on questionnaires. As such, missing data was ignored, and no data imputation was conducted. Prior to testing the main hypotheses of this study, descriptive statistics and assumptions of tests were checked and reported. Given that this is a Repeated-measures (Time-three levels) Within-Subjects design, doubly multivariate MANOVAs were planned to test the primary and secondary hypotheses of this study. This allowed for the changes across the three timepoints to be examined on multiple dependent variables simultaneously. By not conducting multiple t-tests, the researcher avoided increasing the risk of Type I error.

As MANOVAs are an omnibus test and cannot offer information about where differences are found in the data set, individual repeated-measures ANOVAs (Repeated-Measures General Linear Model analyses- GLMs) with post-hoc pairwise comparisons were planned for each of the outcome measures included in the omnibus variables of the two main hypotheses. These were meant to help identify whether time-alone or the group intervention may have produced the changes observed for each outcome variable.

3.1.1 Univariate and multivariate assumptions

3.1.1.1 Types of variables

All relevant outcome variables are measured at a continuous level, and the within-factor variable is categorical and measured at three levels: psychological assessment, pre- and post-intervention timepoint.

3.1.1.2 Linearity and multicollinearity

One of the assumptions of conducting a multivariate analysis is having a linear relationship between each pair of dependent variables for each level of the within-factor variable. If this assumption is not met, the test power reduces (Wickens & Keppel, 2004). Thus, the

researcher tested for this assumption using a scatterplot matrix for each related group of the independent variable and found that the assumption of linearity was met. Regarding multicollinearity, this assumption was tested using correlations between dependent variables and no concern for multicollinearity was found ($r > .90$). Nonetheless, the Cognitive Restraint variable across the three timepoints was found not to correlate moderately with the other variables planned to be included in the omnibus variable MEPs. Therefore, as recommended, this was removed from the omnibus variable, and a separate univariate ANOVA was used to test for differences across time in the level of Cognitive Restraint participants exhibited (Wickens & Keppel, 2004).

3.1.1.3 Absence of univariate and multivariate outliers

Prior to proceeding with statistical analyses, all relevant variables were screened for outliers using boxplot graphs and descriptive statistics. This was done to avoid Type I and Type II errors, which extreme scores on variables can produce in ANOVAs (GLMs) (Tabachnick & Fidell, 2007). When screening the data, outliers were found on the following variables: PHQ-9 at psychological assessment (3), pre- (2) and post-intervention (1) as well pre-intervention UE (1). Given that multivariate analyses are sensitive to univariate outliers, these were treated by replacing their value with one that is less extreme, the next largest value in the data set (Field, 2018).

Furthermore, due to MANOVA's being particularly sensitive to multivariate outliers (Tabachnick & Fidell, 2007), the researcher checked for combinations of extreme scores on two or more variables that may result in multivariate outliers. To test for this, Mahalanobis Distance was computed, and Chi-Square was used to verify for values that may be outliers. As a result, no multivariate outlier was identified in the data set when looking across the nine remaining variables included in the omnibus variable MEPs for our first hypothesis. Likewise, no multivariate outlier was identified in the data set when looking across the nine variables planned to be included in the omnibus variable Wellbeing of our secondary hypothesis.

3.1.1.4 Normality

3.1.1.4.1 Skewness and Kurtosis

To check for the assumption of normally distributed data, the researcher visually inspected the data and reported the skewness and kurtosis statistics for all relevant variables as illustrated in Table 3.1 (Field, 2018).

Table 3.1

Skewness and Kurtosis for dependent variables across timepoints

		Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	Std. Error
Psychological assessment	BES	.37	.36	.01	.71
	CR	.29	.36	-.01	.71
	EE	.04	.36	-.89	.71
	UE	-.20	.36	-.12	.71
	PHQ-9	.40	.36	-.27	.71
	GAD-7	.40	.36	-.31	.71
	CIA	.04	.38	-.76	.74
Pre-intervention	BES	-.11	.37	-.24	.72
	CR	.06	.36	-1.05	.71
	EE	-.23	.36	-.54	.71
	UE	.19	.36	-.31	.71
	PHQ-9	.24	.37	-.43	.72
	GAD-7	.31	.37	-.73	.72
	CIA	-.18	.37	-.99	.72
Post-intervention	BES	.52	.37	-.07	.73
	CR	-.47	.38	.40	.74
	EE	.31	.38	-.52	.74
	UE	.17	.38	-.69	.74
	PHQ-9	.48	.38	-.40	.74
	GAD-7	.95	.38	-.10	.74
	CIA	.96	.37	-.02	.73

3.1.1.4.2 Shapiro-Wilk

As a further precaution, to determine whether the assumption of normality has been violated, the Shapiro-Wilks Statistics (Table 3.2) values were also examined. This test was selected over the Kolmogorov—Smirnov as recommended for a sample size below fifty. On examination, all relevant variables included in the omnibus variable MEPs were found to be normally distributed at each time point, as assessed by Shapiro-Wilk's test ($p > .05$). This was further supported through the examination of histograms and Q-Q normality plots. However, regarding the individual variables included in the omnibus variable Wellbeing, several were not normally distributed: pre- and post-intervention GAD-7 and post-intervention CIA. Furthermore, the researcher attempted to transform the data using square root or inverse

transformation due to the extreme positive skew (Field, 2018), yet even after the transformation, the assumption of normality was violated. As such, the secondary main hypothesis was unable to be tested using an omnibus test. Therefore, univariate analyses and non-parametric tests were used to assess differences between timepoints for each variable planned to be included in the omnibus variable Wellbeing (PHQ-9, GAD-7, and CIA).

Table 3.2

Shapiro-Wilk Test of Normality values for all outcome measures with their associated degrees of freedom and P values

		Shapiro-Wilk[a]		
		Shapiro-Wilk Statistic	df	P value
Psychological assessment	BES	.98	43	.75
	CR	.96	43	.15
	EE	.96	43	.10
	UE	.98	43	.53
	PHQ-9	.96	39	.15
	GAD-7	.96	39	.26
	CIA	.97	39	.43
Pre-intervention	BES	.99	42	.98
	CR	.95	43	.06
	EE	.97	43	.28
	UE	.98	43	.54
	PHQ-9	.95	41	.09
	GAD-7	.93	41	.01
	CIA	.96	41	.18
Post-intervention	BES	.96	40	.18
	CR	.95	39	.08
	EE	.96	39	.22
	UE	.97	39	.47
	PHQ-9	.95	39	.12
	GAD-7	.86	39	.00
	CIA	.87	39	.00

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

3.1.1.5 Sphericity

To investigate whether the assumption of sphericity was met the Mauchly's test of Sphericity was employed for the relevant variables that were found to be normally distributed. The

assumption of sphericity was not violated for the main variables BES ($\chi^2(2) = .94$, p = .36), CR ($\chi^2(2) = .96$, p= .48), EE ($\chi^2(2) = .97$, p = .60), UE ($\chi^2(2) = .98$, p = .68 and PHQ-9 ($\chi^2(2) = .94$ p= .38. As the remaining variables (GAD-7 and CIA) were not normally distributed across the three timepoints sphericity was not calculated and non-parametric testing was planned.

3.1.2 Demographics

Demographics data were explored prior to proceeding with data analyses, and results are summarised in Table 3.3. The average age of participants in our sample was 41.88 years (*SD* = 11.45, range: 25–68), with 34 (77.3%) females and 8 (18.2%) males (two missing values). The small percentage of males in the sample reflects the wider literature suggesting that fewer men access bariatric surgery than women (Liu, 2016). Regarding ethnicity, the sample was homogeneous, with four participants not disclosing their ethnicity. In what concerns the employment status of participants, half were in full-time employment (50%). Within the sample, 15.9% of participants reported attending up to secondary school level, 22.7% reported having attended further education, and 40.9% of participants had attended higher education.

Table 3.3

Demographic Details

Category	Subcategory	Total	
		Mean	SD
Age (in years)		41.88	11.45
		N	%
Gender	Female	34	77.3
	Male	8	18.2
Ethnicity	Arab heritage	*	2.2
	Asian heritage	*	6.8
	Black heritage	8	18
	Mixed heritage	5	12
	White heritage	19	43
	Rather not say	4	9
	Missing values	4	9
Employment	Full-time	22	50
	Part-time	*	9.1
	Unemployed	10	22.7
	Disabled	*	9.1
	Volunteer	*	2.3
Schooling	Rather not say	7	6.8
	Higher	18	40.9
	Further	10	22.7

	Secondary	7	15.9
	Missing values	6	13.6

Note. Values < 5 are represented with *; SD= standard deviation; N= number of participants; %=

3.1.3 Quantitative strand results

3.1.3.1 Primary Hypothesis: Maladaptive Eating Patterns

There will be a significant difference in participants' self-reported maladaptive eating patterns across the three timepoints: psychological assessment, pre- and post-intervention.

A doubly multivariate MANOVA was conducted to test the main hypothesis. The analysis was performed on three outcome measures combined (BES, EE, UE) into the omnibus variable MEPs at the three levels of the within-factor variable. CR was omitted as it violated the assumption of moderate correlations with other variables. A significant difference in mean vectors was found among psychological assessment, pre- and post-intervention timepoints across MEPs measures, F (6, 136) = 13.78, p = .00, Wilks' Λ = .38. This indicates a significant change in participants' maladaptive eating patterns across the three timepoints and suggests that we can reject the null hypothesis. Following these significant omnibus findings, repeated-measures ANOVAs were inspected for the individual variables, as follows. A summary of the results can be seen in Table 3.4.

Table 3.4

The doubly multivariate MANOVA for MEPs and Repeated Measures Analyses of Variances for BES, CR, EE, and UE with their degrees of freedom and respective effect sizes

Measure	Psychological assessment		Pre-Intervention		Post-Intervention		F	Df	η^2
	M	SD	M	SD	M	SD			
MEPs							13.78**	6 136	.38
BES	23.32	7.71	21.27	8.97	13.49	8.99	45.32**	2 72	.56
CR	42.34	21.41	43.82	22.67	45.40	19.77	.37	2 72	.01
EE	62.74	21.15	55.93	23.31	43.54	26.29	20.48**	2 72	.36
UE	56.13	17.84	52.33	19.57	37.73	21.69	29.21**	2 72	.45

** p < .01

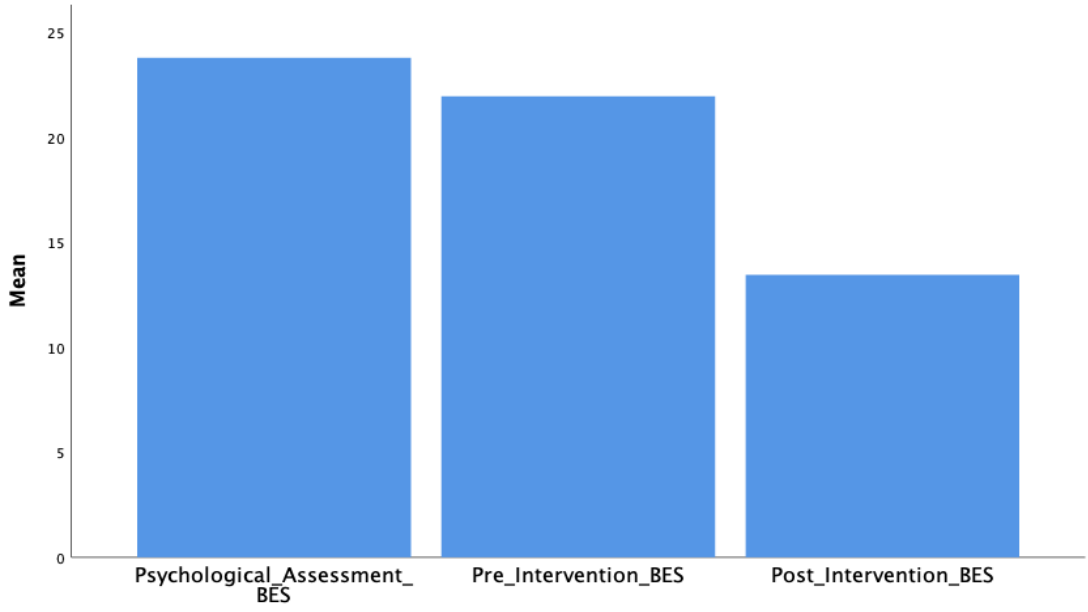
3.1.3.1.1 Binge Eating sub-hypothesis

There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the BES at post-intervention, as compared with pre-intervention and psychological assessment timepoints; with no significant difference expected between psychological assessment and pre-intervention timepoints.

A significant change in participants' scores on the BES was found between psychological assessment, pre- and post-intervention timepoints, F (2, 72) = 45.32, p < .01, η2 = .56, with scores decreasing from psychological assessment (M= 23.32, SD= 7.71) to pre-intervention (M=21.27, SD= 8.97) to post-intervention (M=13.49, SD= 8.99) as illustrated in Figure 3.1. By inspecting the post hoc pairwise analysis with a Bonferroni adjustment, we observed that participants' scores on the BES significantly decreased at post-intervention as compared to pre-intervention (M= 7.78, 95% CI [5.8, 9.76], p > .01) and psychological assessment timepoint (M= 9.83, 95% CI [7.40, 12.28], p > 01), rejecting thus the null hypothesis. There was no significant difference found between psychological assessment and pre-intervention timepoint (M= 2.05, 95% CI [.13, 4.24], p = .7). These results suggest that the reported significant decrease in BES scores at post-intervention may be attributed to the group intervention rather than the passing of time alone.

Figure 3.1

Binge Eating Scale mean scores at psychological assessment, pre- and post-intervention



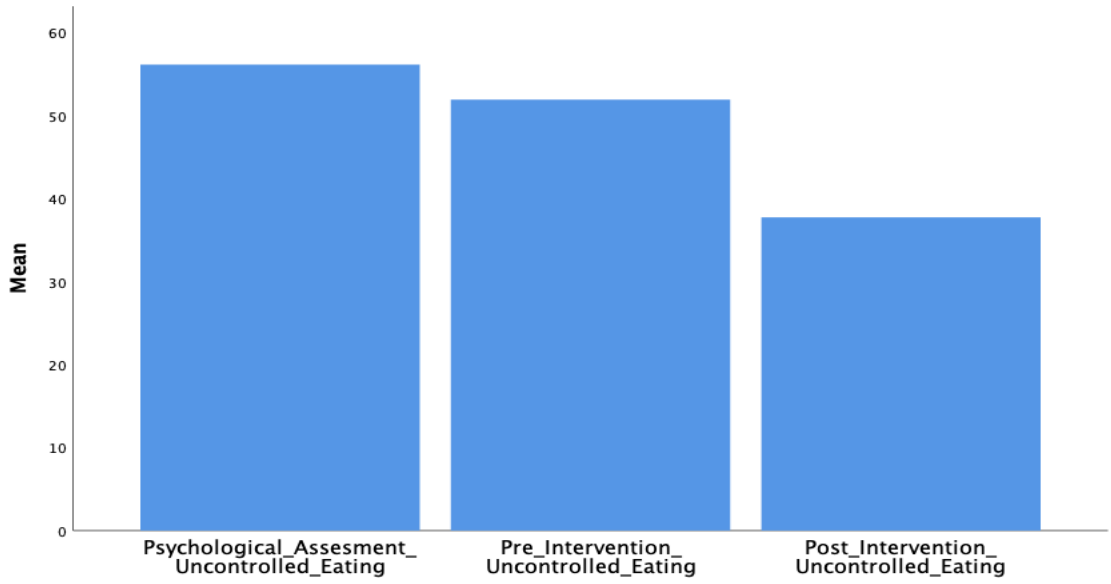
3.1.3.1.2 Uncontrolled Eating sub-hypothesis

There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the Uncontrolled Eating subscale of the TFEQ-R18V2, at post-intervention, as compared with pre-intervention and psychological assessment timepoints; with no significant difference expected between psychological assessment and pre-intervention timepoints.

A repeated-measures ANOVA revealed a significant change in participants' scores on the UE subscale of TFEQ-R18V2 between psychological assessment, pre- and post-intervention timepoints, $F(2,72) = 29.21$, $p < .01$, $\eta 2 = 0.45$; with scores decreasing from psychological assessment (M= 56.13, SD= 17.84) to pre-intervention (M= 52.33, SD= 19.57) to post-intervention timepoint (M= 37.73, SD= 21.69) as per Figure 3.2. Post hoc pairwise analysis with a Bonferroni adjustment revealed that participants' scores on UE subscale significantly decreased at post-intervention as compared to pre-intervention (M= 14.60, 95% CI [9.38; 19.81], p <.01) and psychological assessment (M= 18.40, 95% CI [12.96; 23.84], p < .01). As no significant differences were found between psychological assessment and pre-intervention timepoint (M= 3.80, 95% CI [.99; 8.60], p = .12), these findings suggest that the significant decrease that participants reported in Uncontrolled Eating after the group may be due to the effect of the intervention rather than the passing of time alone.

Figure 3.2

Uncontrolled Eating mean scores at psychological assessment, pre- and post-intervention



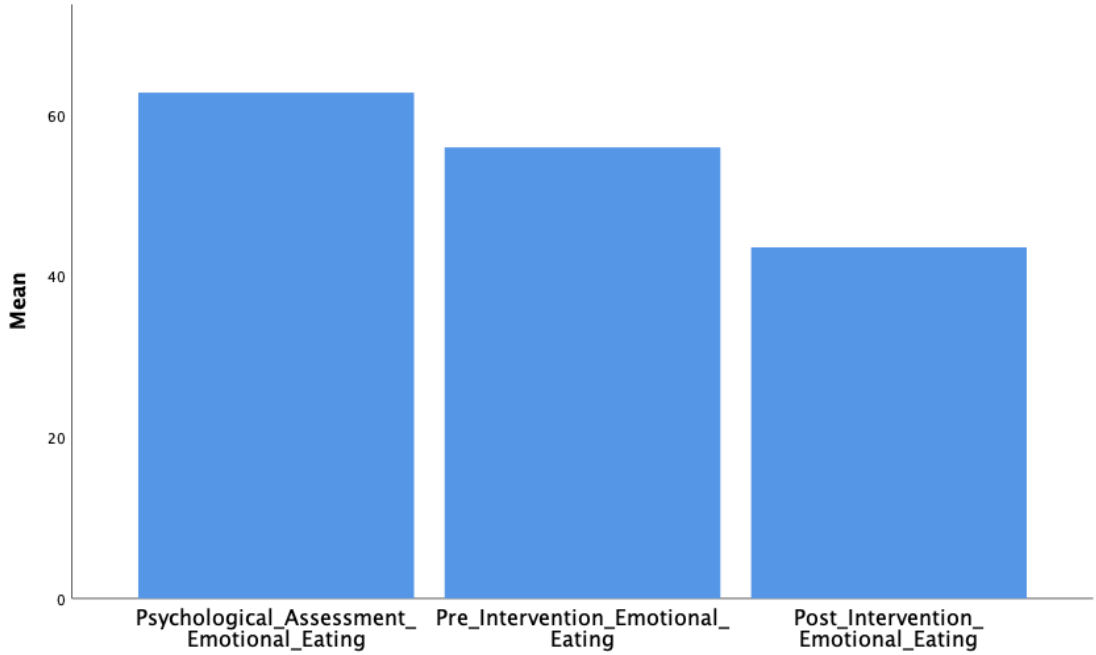
3.1.3.1.3 Emotional Eating sub-hypothesis

There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the Emotional Eating (EE) subscale of the TFEQ-R18V2 at post-intervention, as compared with pre-intervention and psychological assessment timepoints; with no significant difference expected between psychological assessment and pre-intervention timepoints.

A repeated-measures ANOVA revealed a significant change in participants' scores on the EE subscale of TFEQ-R18V2 between psychological assessment, pre- and post-intervention timepoints, $F (2, 72) = 20.48$, $p < .01$, $\eta^2 = .36$; with scores decreasing from psychological assessment (M= 62.74, SD= 21.15) to pre-intervention (M= 55.93, SD= 23.31) and post-intervention (M= 43.54, SD= 26.30) as per Figure 3.3. A closer inspection of post hoc pairwise analysis (Bonferroni adjustment) revealed that participants' scores on the EE subscale significantly decreased at post-intervention as compared to pre-intervention (M= 12.40, 95% CI [6.63, 18.16], $p < .01$) and psychological assessment timepoint (M= 19.20, 95% CI [12.55, 25.84], $p < .01$). Furthermore, a smaller yet significant difference was found between psychological assessment and pre-intervention timepoints (M= 6.80, 95% CI [.74, 12.86], $p < .05$) suggesting thus, that the significant decrease in Emotional Eating participants reported at post-intervention may be due to the effect of time as well as the intervention.

Figure 3.3

Emotional Eating mean scores at psychological assessment, pre- and post-intervention



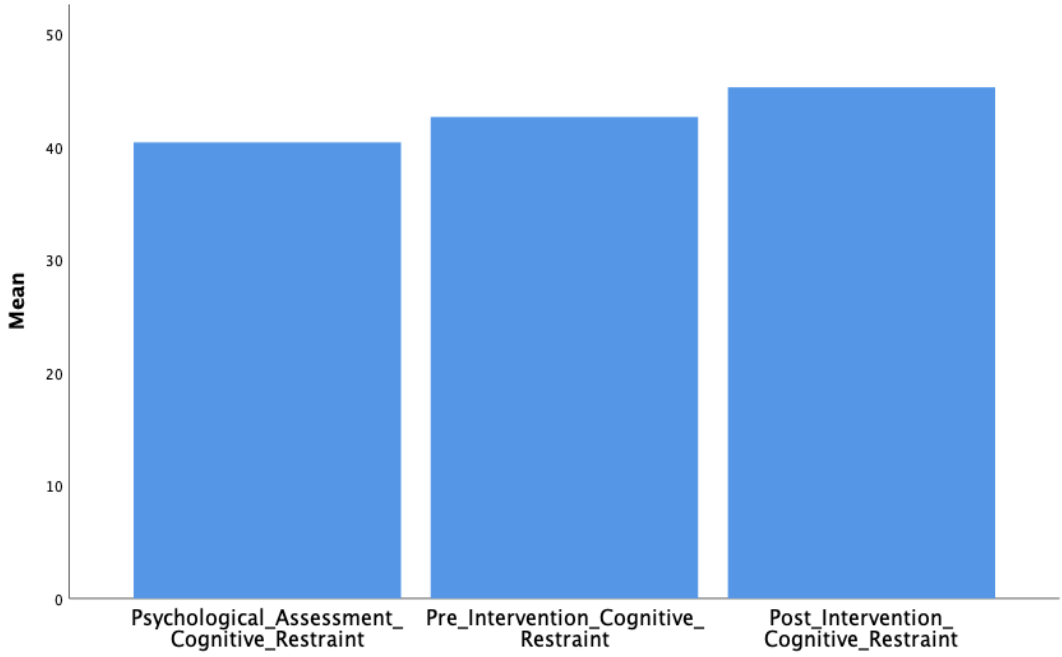
3.1.3.1.4 Cognitive Restraint sub-hypothesis

There will be a significant difference in participants' self-reported scores on the Cognitive Restraint (CR) subscale of the TFEQ-R18V2 at post-intervention, as compared with pre-intervention and psychological-assessment timepoints. Informed by the CR theory, it is expected participants will present with moderate scores post-intervention with no significant difference expected between psychological assessment and pre-intervention timepoints.

A repeated-measure ANOVA was conducted with no significant change in participants' scores on the CR subscale of TFEQ-R18V2 being found between psychological assessment, pre- and post-intervention timepoints, F (2, 72) = .37, p =. 69, η^2 = .01); with scores increasing from psychological assessment (M= 42.34, SD= 21.41) to pre-intervention (M= 43.82 SD= 22.67) to post-intervention (M= 45.40, SD= 19.77) as seen in Figure 3.4. No significant differences were found when conducting the post hoc pairwise analysis. Therefore, we can accept the null hypothesis and reject the proposed alternative hypothesis.

Figure 3.4

Cognitive Restraint mean scores at psychological assessment, pre- and post-intervention



3.1.3.2 Secondary Hypothesis: Wellbeing

There will be a significant difference in participants' Wellbeing (as measured by the PHQ-9, GAD-7, and CIA) between the three timepoints: psychological-assessment, pre- and post-intervention.

A doubly multivariate MANOVA was planned to be conducted to test the secondary hypothesis by combining three outcome measures PHQ-9, GAD-7, CIA-3.0 into the omnibus variable Wellbeing, at the three levels of the within-factor variable. Given that one of the assumptions of this test is univariate normality and that three of the variables that were to be included in the omnibus variable Wellbeing, were found not to be normally distributed (GAD-7 scores at pre- and post-intervention and CIA-3.0 scores at post-intervention) the researcher was unable to test the secondary hypothesis using a doubly multivariate MANOVA. Transformations were attempted (square root and inverse transformations; Field, 2018) to address the skewness of the distribution for these three variables, however, these were unable to address the normality of the distribution. As currently there is no equivalent non-parametric test for a doubly multivariate MANOVA, differences across each individual variable were inspected using parametric and non-parametric tests as appropriate. A repeated-measures ANOVA was conducted to assess for differences in mood across time (PHQ-9) and Friedman's non-parametric test was conducted to assess for differences in anxiety levels (GAD-7) and quality of life as related to disordered eating (CIA-3.0) across time.

Table 3.5

The Repeated Measures Analysis of Variances for PHQ-9 and Friedman's test for GAD-7, and CIA-3.0 with their degrees of freedom and their respective effect sizes.

Measure	Psychological assessment		Pre-Intervention		Post-Intervention		F/λ²	Df	η²
	M	SD	M	SD	M	SD			
PHQ-9	10.86	6.23	9.40	5.26	4.80	3.41	29.60**	2; 68	.46
GAD-7	8.2	5.37	7.80	4.66	4.7	4.9	16.30**	2	.23
CIA	25.4	11.20	21.20	11.30	12	11.73	31.43**	2	.49

** p < .01

3.1.3.2.1 Mood sub-hypothesis

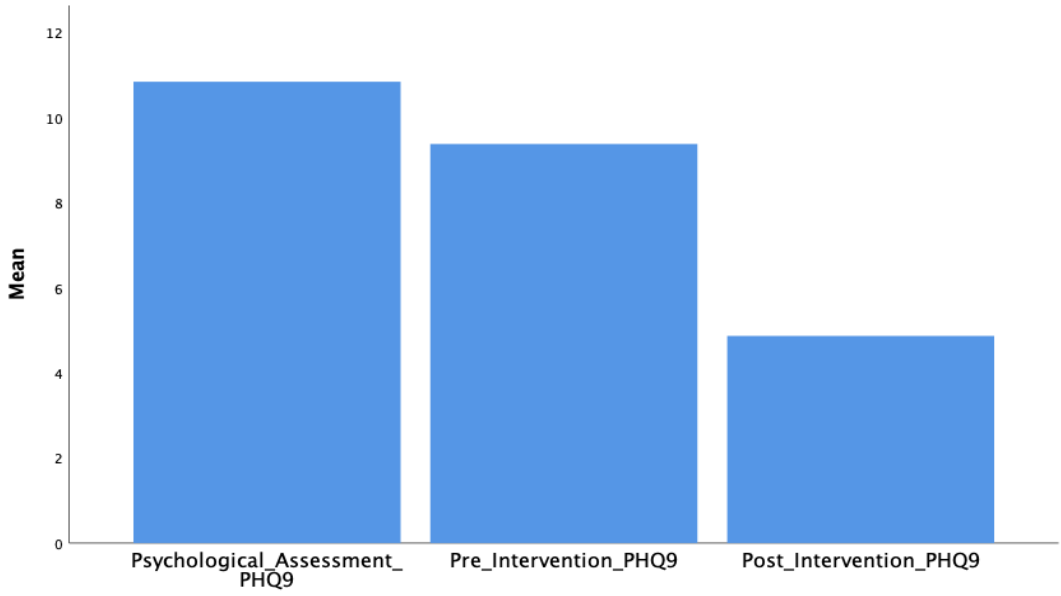
There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the PHQ-9 at post-intervention, as compared with pre-intervention and psychological assessment timepoints; with no significant difference expected between psychological assessment and pre-intervention timepoints.

A significant change in participants' scores on the PHQ-9 was found between psychological assessment, pre- and post-intervention timepoints, F (2, 68) = 29.60, p < .01, η^2 = 0.46, with scores decreasing from psychological assessment (M= 10.86, SD= 6.23) to pre-intervention (M= 9.4, SD= 5.26) to post-intervention (M= 4.80, SD= 3.41) as seen in Figure 3.5. By

inspecting the post hoc pairwise analysis with a Bonferroni adjustment, we observed that participants' scores on the PHQ-9 significantly decreased at post-intervention as compared to pre-intervention (M= 4.60, 95% CI [2.98; 6.22], p < .01) and psychological assessment timepoint (M= 6.06, 95% CI [4.21, 7.91], p < .01), rejecting thus the null hypothesis. There was no significant difference found between psychological assessment and pre-intervention timepoint (M= 1.46, 95% CI [.06, 2.98], p = .06). These results suggest that the reported significant decrease in low mood symptoms (PHQ-9) scores at post-intervention may be attributed to the group intervention rather than the passing of time alone.

Figure 3.5

PHQ-9 mean scores at psychological assessment, pre- and post-intervention



3.1.3.2.2 Anxiety sub-hypothesis

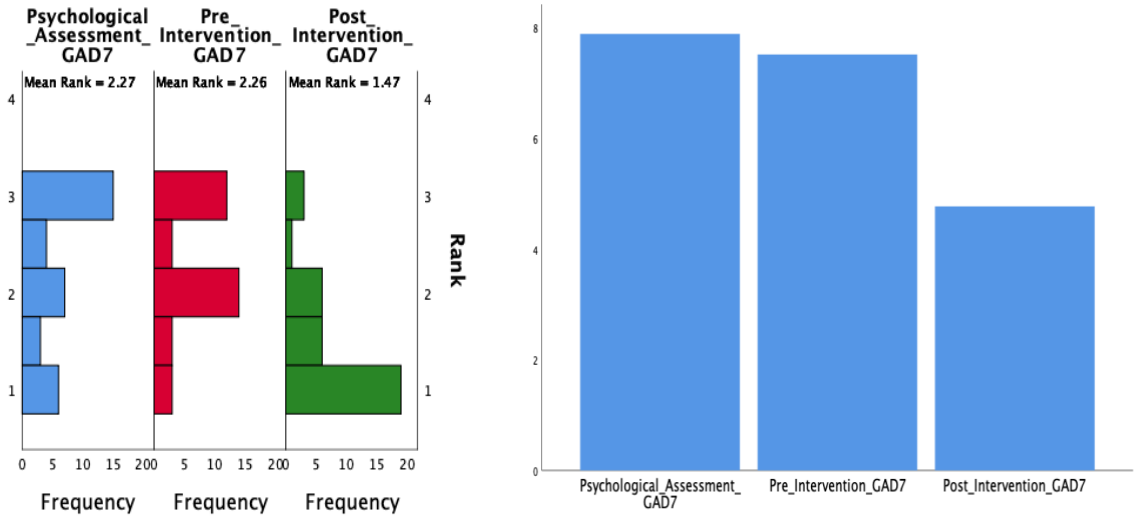
There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the GAD-7 at post-intervention, as compared with pre-intervention and psychological assessment timepoints; with no significant difference expected between psychological assessment and pre-intervention timepoints.

A Friedman test was carried out to investigate whether there is a significant difference in participants' anxiety scores across the three timepoints. All assumptions of the non-parametric test were met as variables were continuously distributed, came from the same group of participants across three timepoints. A significant change in participants' scores on the GAD-7 was found between psychological assessment, pre- and post-intervention timepoints, λ^2 (2) = 16.30, p > .01, Kendall's W= .23 with scores decreasing from psychological assessment

(M= 8.2, SD= 5.37) to pre-intervention (M= 7.8, SD= 4.66) to post-intervention (M= 4.7, SD= 4.9) as seen in Figure 3.6. By inspecting the post hoc pairwise analysis with a Dunn-Bonferroni adjustment we observed that participants' mean rank scores on the GAD-7 significantly decreased at post-intervention as compared to pre-intervention (M= .79, p <.01) and psychological assessment timepoint (M= .80, p < 01), rejecting thus the null hypothesis. There was no significant difference found between psychological assessment and pre-intervention timepoint (M= .01, p = 1). These findings suggest that the significant decrease that participants reported in anxiety scores (GAD-7) after the group, might be due to the effect of the intervention rather than the passing of time alone.

Figure 3.6

Related-Samples Friedman's Two-Way Analysis of Variance by Ranks and GAD-7 mean scores at psychological assessment, pre- and post-intervention



3.1.3.2.3 Quality of life sub-hypothesis

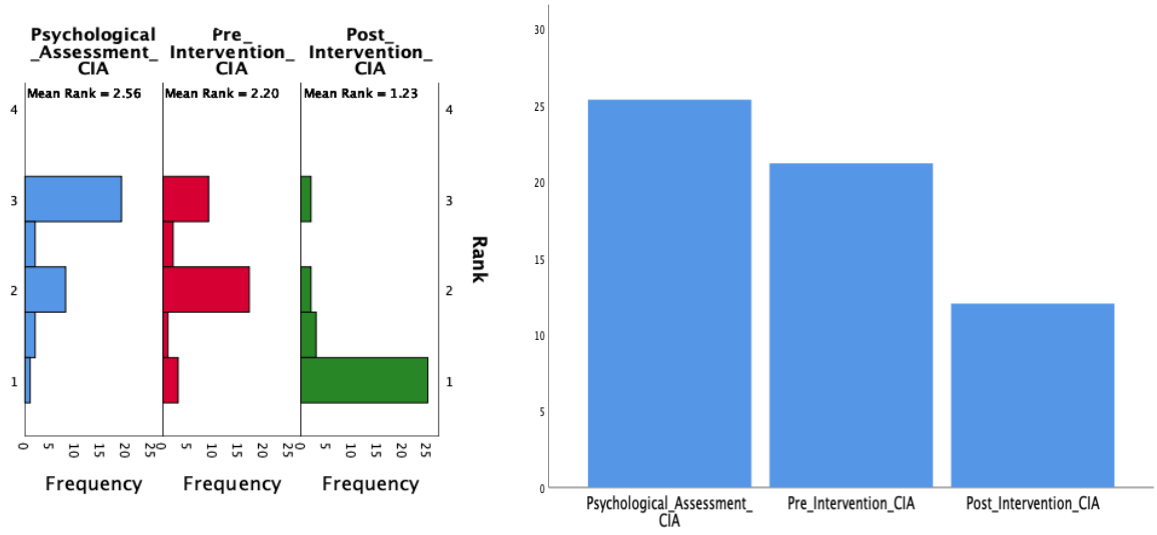
There will be a significant decrease (i.e., improvement) in participants' self-reported scores on the CIA-3.0 at post-intervention, as compared with pre-intervention and psychological assessment timepoints; with no significant difference expected between psychological assessment and pre-intervention timepoints.

A Friedman test was carried out to investigate whether there is a significant difference in participants' psychosocial impairments across the three timepoints. All assumptions of the non-parametric test were met as variables were continuously distributed, came from the same group of participants across three timepoints. A significant change in participants' scores on

the CIA-3.0 was found between psychological assessment, pre- and post-intervention timepoints, λ^2 (2) = 31.43, p <.01, Kendall's W= .49 with scores decreasing from psychological assessment (M= 25.4, SD= 11.20) to pre-intervention (M= 21.2, SD=11.30) to post-intervention (M= 12, SD= 11.73) as seen in Figure 3.6. By inspecting the post hoc pairwise analysis with a Dunn-Bonferroni adjustment we observed that participants' mean rank scores on the CIA-3.0 significantly decreased at post-intervention as compared to pre-intervention (M= .97, p <.01) and psychological assessment timepoint (M= 1.33, p < 01), rejecting thus the null hypothesis. There was no significant difference found between psychological assessment and pre-intervention timepoint (M= .36, p= .45). These findings suggest that the significant decrease that participants reported in psychosocial impairments related to disordered eating features (CIA) after the group, might be due to the effect of the intervention rather than the passing of time alone.

Figure 3.7

Related-Samples Friedman's Two-Way Analysis of Variance by Ranks and CIA-3.0 mean scores at psychological assessment, pre- and post-intervention



3.1.4 Summary of Quantitative Strand Results

The primary aim of the research was to find out if a brief CBT-informed group intervention could improve participants' MEPs, with the secondary aim being to assess if the group also had an impact on improving participants' Wellbeing. It was found that participants binge eating, emotional and uncontrolled eating significantly reduced at post-intervention compared with pre-intervention. While no significant improvement was found between psychological assessment and pre-intervention for binge eating and uncontrolled eating, this was not the

case for emotional eating. No significant differences were reported on participants' cognitive restraint scores, with scores remaining in the moderate range from psychological assessment timepoint to post-intervention.

Regarding the secondary main hypothesis, due to the non-normally distributed data, it was not possible to combine variables PHQ-9, GAD-7, and CIA-3.0 into the omnibus variable Wellbeing. Nonetheless, individual analyses found significant improvement in participants scores on mood, anxiety and psychosocial impairments related to disordered eating after the group as compared to pre-intervention and psychological assessment timepoint. Overall, this suggests that the group, rather than the passing of time alone, positively impacted participants' MEPs and Wellbeing. Given that the assumptions for the analyses were met, it may be possible to assume that these results may generalise to any group of people undertaking the group intervention.

3.2 Qualitative Strand Analyses

The following section of the chapter presents the results of the thematic analysis of the textual data from the four semi-structured interviews carried out and the qualitative feedback provided by the 40 group participants on their feedback questionnaires. First, an outline of the stages of thematic analysis will be provided, followed by the presentation of themes and sub-themes that resulted from the analysis with quotes illustrating these and ending with a summary of qualitative results.

3.2.1 Semi-structured interviews data

As highlighted above, four semi-structured interviews (Appendix G for a detailed description of questions) were conducted with participants who attended the group intervention. All participants were given pseudonyms to protect their identity. The interviewed participants were all women (Mona, Ana, Rania, Bessy) of different ethnic backgrounds with ages ranging between 30-to-43-years-of-age. The average interview duration time was 30 minutes. All interviews took place online. Situating the sample and providing an adequate description of interview participants to contextualise the findings (Elliott et al., 1999) was limited by the ethical approval to include only de-identified samples.

3.2.2 Feedback questionnaires data

Forty out of 44 participants that completed three sessions out of the four sessions of the group intervention filled in the feedback questionnaires. The response rate showed that, on average, per question, 36 participants responded to the seven open-ended questions, ranging from 32 to 40 responders per question (see Appendix F for further details). All participants responded

to the last three questions that were rated on a five-point Likert scale on the feedback questionnaire, regarding the frequency with which they practised the skills learnt at home, how likely it is that they would recommend this group to others and how helpful they have found the overall group intervention. Only 18 participants added further comments. All textual data from the feedback questionnaire was included in the data analysis. All feedback questionnaire participants were given pseudonyms.

3.2.3 Analytic strategy in thematic analysis

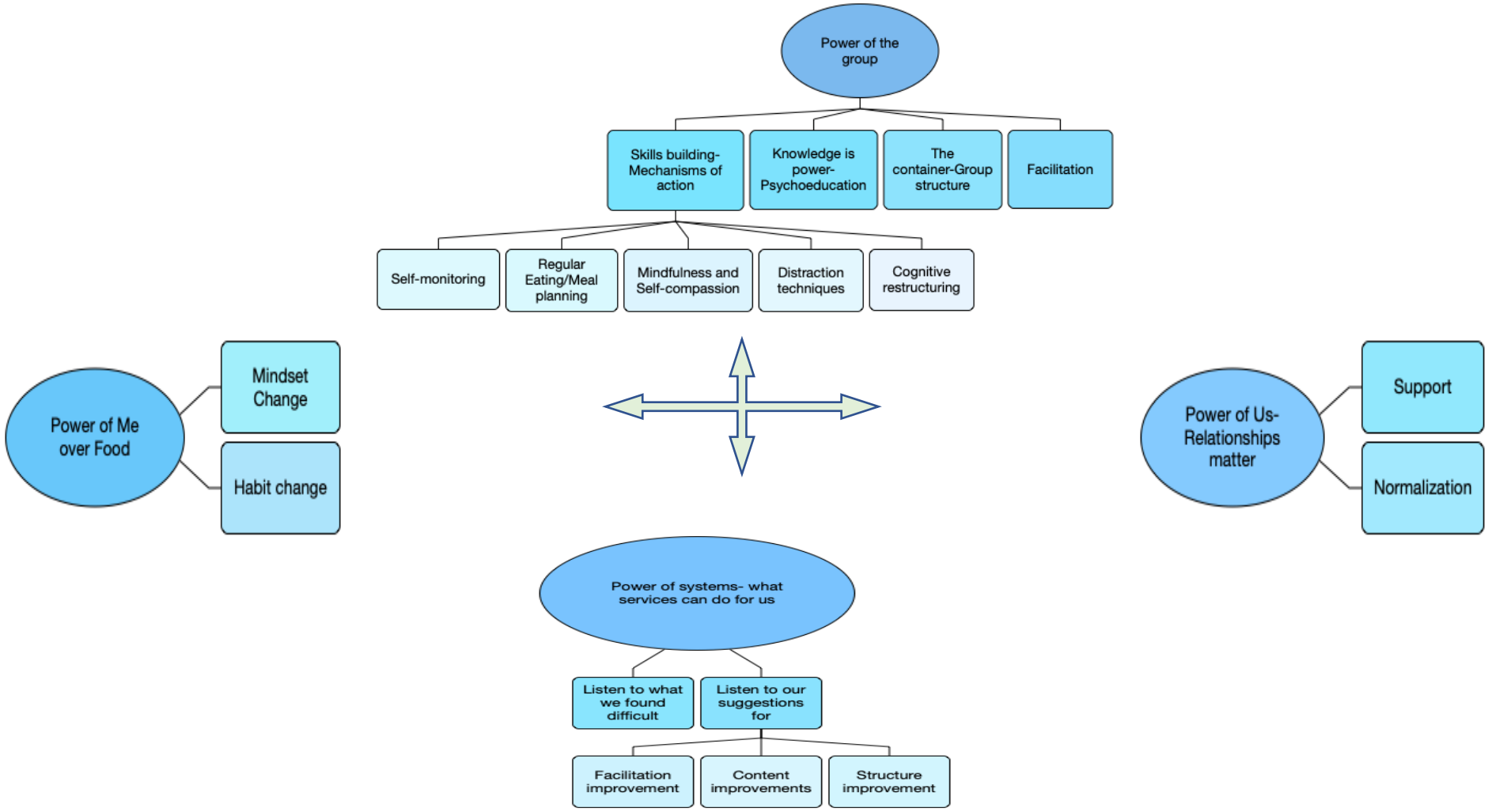
The analytic strategy followed the 'six stages' proposed by Braun and Clark (2006) for thematic analysis. The researcher took an inductive 'bottom-up' approach to identify themes and patterns, not trying to fit the data to prior theory or coding frames but instead letting themes and codes emerge from the data. The data was analysed at a semantic, explicit level whereby the researcher did not attempt to infer latent meanings but rather identify patterns in the semantic content and look at their broader implications and meaning (Boyatzis, 1998). The familiarisation stage, which is the first stage of analysis, involved immersion in the data set by listening to the recordings and reading and re-reading each transcript alongside the feedback questionnaires. Within the second stage of the analysis, codes were generated from the data set identifying salient features relevant to the research question. The process consisted of writing the codes next to each paragraph in the printed transcripts and then re-reading them and coding them in NVIVO software.

This process was then followed by cross-checking the codes in paper format with those from the software until all of them were collated. Following, the codes were compared and contrasted, with similar ideas and salient patterns of meaning being identified as candidate themes. Furthermore, these were checked against the data set, combined, discarded, or refined to ensure that the remaining themes and subthemes are compelling, logically derived from the data whilst also answering the research question looking at capturing the experience that participants had of the group intervention. Within the original mind map (please see Appendix L), some of the master themes and sub-themes presented with some overlap and a disproportion in the number of text references, which suggested that some master themes might be less salient. This led to changes in the number of master themes, with one master theme being subsummed in another due to overlap and low references (Power of you- The facilitator master theme became Facilitation sub-theme included in Power of the Group). The changes made at stage four of analysis allowed for the minimisation of overlap between themes, making the process more objective and the themes more distinctive. In the fifth stage of the analysis, the researcher revisited the transcripts and the textual feedback questionnaire answers to ensure that the final proposed master themes with their associated sub-themes

were evident in the data set (see Appendices M visual illustration of themes and sub-themes across data set). Illustrative quotations were further collected to provide evidence for each of the themes proposed. In the sixth and final stage of the analysis, the data extracts, codes, and themes (please see Figure 3.8. for details) were refined and further linked into a narrative that will be rendered below.

Figure 3.8

Final master themes with sub-themes map and some of the relevant codes



3.2.4 Qualitative Strand results

The thematic analysis rendered four master themes with ten sub-themes that are illustrated in Table 3.6 and Figure 3.8 and further presented below in a narrative account (Braun & Clarke, 2006). To ground the findings in the data and allow the reader to evaluate whether the interpretation of results fits the data set (Fossey et al., 2002), quotations were provided throughout the narrative account. To protect the anonymity of participants, pseudonyms were provided for each quotation. Some of the quotations are integral, whilst some have parts that were omitted due to the lack of relevancy to the theme. When this was the case, the researcher denoted this by [..]. Noteworthy is that the amount of analysis presented in the following narrative for each theme does not represent the prevalence of the themes, as these were positioned across the data set (for more details, please refer to Appendix N).

Table 3.6

Master themes and sub-themes generated from the interviews and feedback questionnaires

Master themes	Sub-themes
Power of the group- *What we liked about the group*	*Knowledge is power- Group content* *Skills building- Mechanisms of action* *The container- Group structure* *Facilitation*
Power of Us- *Relationships matter*	*Normalisation* *Support*
Power of Me over food- *Improved relationship with food*	*Mindset change* *Habit change*
Power of Systems- *What services can do for us*	*Listen to our difficult group experiences* *Listen to our suggestions for improvement*

3.2.5 Narrative accounts of results

3.2.5.1 Theme one: Power of the group- What we liked about the group

This master theme encapsulated the positive experiences participants had of the group intervention. Across the feedback questionnaires and when exploring in more depth in individual interviews, participants reported having found the group information and skills helpful. Most participants commented on finding the group structure adequate for online settings. Regarding the facilitation of the intervention, most participants reported having had

a positive experience with facilitators. The group intervention was perceived overall as helpful and informative by participants. This organising theme subsumes the following sub-themes.

3.2.5.1.1 Knowledge is power

Most participants reported that the group psychoeducation raised their awareness about their maladaptive eating patterns. The information on the different types of maladaptive eating patterns was considered informative by participants, as well as the recommendations of further readings made by facilitators. Some participants mentioned that this information was also valuable in helping them understand their dysfunctional eating patterns and re-evaluate their behaviours to make the necessary changes to address them. Participants referred to the group information as educational and something they can return to when needing support. The following quotations were selected to illustrate this basic theme of "knowledge is power" that sits under the organising theme Power of the Group.

> *"Well, I found the group very helpful. There was one thing that was said to me that kind of clicked to my head and kind of Aha! Moment. And it was regarding fasting. Because I naturally fast, it's not intentional it's just the way I've always been, and that's always kept me slim. But not this time! Ahm… And I was told that fasting can build up hunger pangs which are bigger than what is necessary for my body. And I know it sounds obvious, but it was just having someone say that for the first time it just clicked and ever since then I've not had an issue."* Rania- interview participant

> *"pretty good (group psychoeducation), I mean I've printed some of it out, some of it I still got to print out […] I already have one of the books that they suggested about binge eating."* Mona- interview participant

> *"The information I gathered that I was not aware previously. I was able to put a name to binge eating with the programme."* Ian- feedback questionnaire

> *''favourite part was the information relating to binging and fasting"* Kia- feedback questionnaire

> *"The presentations, very useful information"* Fran- feedback questionnaire

3.2.5.1.2 Skills building for pattern-breaking

Clear within all participants accounts was the importance of the skills learnt during the group intervention. Participants reported a variety of skills to have been useful in helping them reduce/stop their maladaptive eating patterns and in helping them manage triggering

situations. They spoke of how the group helped them re-evaluate their habits and make healthier choices around their dietary intake. Some participants reported that the group helped them distinguish between physical and emotional hunger. Participants reported having found self-monitoring useful for breaking their denial around their eating patterns by bringing to their awareness the amount and type of food they consumed daily. Implementing a regular eating pattern and meal planning were the most referenced mechanisms of action of the group intervention. Participants spoke about how these two strategies alone helped reduce their binge eating and address their maladaptive eating patterns. Participants also frequently mentioned Distraction techniques as popular strategies in helping them curve the urge to binge or emotionally eat. Mindfulness and self-compassion were other strategies that participants reported to be helpful, with some stating they will continue practising these following the group.

> *"Made me realise that I don't need fad diets and that its ok to have dinner past 7pm which I do now, meaning I'm still full when it comes to bedtime and not having the munchies come 10 pm. And it's also ok to have a small snack in between meals. I always thought this was a big no, no! I now have a box with healthy snacks rather than sweets and chocolate" Tania* - feedback questionnaire

> *"What was the most useful thing about attending the group?*
> *Tools such as regular eating, binge postponement, self - compassion" Victoria*- feedback questionnaire

> *"Has the group affected the way in which you approach food and eating?*
> *Yes. Eating mindfully, self-compassion, regular meals and snacks, listen to self"*
> Ieva- feedback questionnaire

> *"I realized that if I do something that I'm just sitting down or… is very hard for me to get off my own mind. So, I ended up doing things, putting things into the cookie jar that were kind of physical. So, sort of going for walks or exercise, something that involves my hands, I found really useful as well."* Ana- interview participant

> *"Learnt different ways to try and distract myself, so reading… And I couldn't go for a walk but now I can. Yei! [giggles] I'm officially free, well I had my jab but wasn't supposed to really go out but apparently from today, people that are shielding can go out, but just be cautious so… I'll be able to take folks outside instead of being stuck in my house in my back garden because it's a different scene, less likely to tempt myself"* Mona- interview participant

3.2.5.1.3 Facilitation

Most participants provided feedback about the facilitators at the end of the group intervention (36 responders out of 40 participants), and this sub-theme also featured in the individual interviews. Participants spoke about having found the facilitators approachable and friendly. They also stated to have found the facilitators helpful in making them feel comfortable and creating a safe space throughout the group intervention. An essential aspect of the group's safety was the non-judgemental approach facilitators modelled, allowing participants to discuss their eating patterns openly. While participants reported finding facilitators knowledgeable, they described their vocabulary as easy to understand and their examples relatable.

> *"They were wonderful, I couldn't fault them at all. They were so nice to us, they were understanding and really helpful and they were willing to put in that extra mile. If they… if someone needed whatever information or wherever. They were really good both of them."* Mona- interview participant

> *"They were great and always gave us time to share our thoughts and I found it really helpful that they were able to make suggestions that were flexible to our personal needs, and they encouraged everyone to share in the group."* Ina- feedback questionnaire

> *"You know, they were very open to discussion, and it wasn't rigid and regimental, it was very flexible and easily digestible which made the time fly."* Rania- interview participant

> *"Excellent. Made me very comfortable. They are clearly very compassionate and passionate about helping people."* Tim- feedback questionnaire

3.2.5.1.4 The container- group structure

Participants reported having found it acceptable for the group intervention to be offered online during the pandemic and felt that this was a good alternative rather than waiting until the intervention could be resumed to face-to-face sessions. In addition, some participants mentioned that having the choice of attending the group intervention online could potentially be a better option for some, even following the pandemic.

Most participants considered the length of sessions suitable for online settings, allowing them to maintain engagement in the intervention. One participant reported finding the questionnaires as a good introduction to the group, allowing them to reflect on their eating

patterns before engaging in the intervention. Also, the questionnaires provided participants with a chance to assess their progress at the end of the intervention. The group format was seen as a supportive network that offered people the opportunity to share their relationships with food. Having a group intervention was seen as preferable to the intervention being offered individually, as participants noted to have enjoyed being around other people going on similar journeys on the bariatric pathway. Some illustrative quotations of this sub-theme are offered below.

> *"No, I think it was good as it was. Um, four sessions within an hour, two hours per session, it was just the right amount of time to keep you engaged in the session. It feels very hard when you're like, um... over the phone to keep you or like over zoom. So, I say, to keep you engaged for a long amount of time and… But it was just, just the right amount of time. Yeah, I think that it was good."* Ana- interview participant

> *"I found them relevant, because for me when I did the questionnaire before the course and the one I did after the course I could see a big difference. You know? So, it's a really good way of gaging at the kind of results, immediate result from the course. And it helps you to look back and say: Uh, I made that progress!"* Rania- interview participant

> *"I like it, I mean it's different to say the least, but I also understand as well, it was safest, especially as I'm sure thing. I don't know if any I can't remember, I can't remember, if any of the others were shielding as well. But it was good, as well, because it gives another person, it gives another aspect, or if you can't physically join, for whatever reason, there are other ways out there, that you can join through, and I think, in a sense, in a way, I think this pandemic has opened up a lot of doors for stuff like that to happen."* Mona- interview participant
>
> *"being part of a group of similar people to me and being able to express how I feel in a safe manner."* Sian- feedback questionnaire

> *"Would you have preferred it as an individual intervention if you had the... [participant interrupts]*
>
> *Ana: No, I think it's better as a group presentation. it's, it's nice to be able to socialize with people who are in the same boat was you. Um, when it's yourself, it can be… I don't know how to explain it… I guess it could be just a bit targeted, yeah! But when you're with other people is very general and very approachable, yeah."* Ana- interview participant

3.2.5.2 Theme two: Power us- Relationships Matter

This second master theme was prevalent in feedback questionnaires, and the accounts participants offered in their interviews. Participants across the group interventions emphasised the importance of the group as a source of support and normalisation. The relationships participants formed with each other transpired as more important than those they formed with the facilitators of the group intervention. The opportunity to share their problematic relationship with food with others and to listen to similar journeys was seen as a conducive factor to change. Participants valued the group interactions and discussions and described them as the most enjoyable parts of the group intervention on their feedback questionnaires. Below are some of the sub-themes included in this master theme.

3.2.5.2.1 Support

For both interviewees and other group participants, their interactions with each other played a pivotal role in their positive experience of the group intervention. Their similar struggles with food and eating patterns were the foundation of a sense of togetherness which contributed to shattering the feeling of loneliness. This was particularly meaningful during the difficult pandemic times, given that some participants were shielding. Participants described feeling heard and supported by others and feeling good in being able to support others who struggled in the group. These meaningful interactions made it easier for participants to connect to each other, particularly in online settings. One participant spoke about friendships being one of the unexpected benefits of the group intervention. A resounding majority mentioned the group interactions as their favourite part of the group intervention on their feedback questionnaire. The following excerpts are offered to illustrate the power of this sub-theme.

> *"R: Were there any unexpected benefits from the group intervention?*
> *Mona: Friendships, understanding. I wasn't sure what I was gonna end up with, or what I was going to get out of it, but I guess, I kind of… to say a better understanding of myself and why I do things the way I do."* Mona- interview participant

> *"I enjoyed hearing other people. It made me realise it wasn't just me feeling the way I felt. It was a shame it had to end. Everyone was lovely"* Gina- feedback questionnaires

> *"So, I found the group really helpful, and it was great to kind of go through the process with others and hear that they had similar issues, so I didn't feel kind of alone in it."* Rania- interview participant

> *"I think, I think for other people in the group, it was one lady in the group that did seem to feel that way [body image difficulties], and we all tried to encourage her so it was*

good that she was in the group so that she could hear how we, how we perceive her. […] So, I think it does help if it's strangers that show you how to have that compassion for yourself if you don't have it." Bessy- interview participants

3.2.5.2.2 Normalization

Another aspect that participants reported having found beneficial in the group is the validation that their struggles are not abnormal and that others have similar problems. Further, participants described that an important part that made their interactions powerful was the lack of judgement from other participants and the facilitators. This created a sense of safety and broke through the shame of discussing such sensitive topics with strangers.

"I enjoyed every aspect of the group, especially the interactive, it makes me realise that I am not alone facing similar problem." Matt- feedback questionnaire

"Cause… Cause for me sometimes I feel like: Is it normal to feel this way? And then when I hear other people say it it's like: Oh, okay that's normal! You know?" Rania- interview participant

"I felt I am not alone with this problem" John- feedback questionnaire

"It did… they didn't make me feel disgusted about myself or embarrassed or ashamed, there was a very warm welcoming atmosphere with a bunch of other people who were in a similar position to me and not judgmental […]" Mona- interview participant

"Hearing other people talk - knowing I'm not alone in how I think or feel" Diana- feedback questionnaire

3.2.5.3 Theme three: Power of Me over food- Improved relationship with food

This third master theme subsumes how participants made use of the group intervention to improve their relationship to food, with most participants reporting a change in either mindset or their eating habits (38 participants out of 40 responders on the feedback questionnaire). Whilst four participants reported no change in their eating patterns on the feedback questionnaire, they continued to mention several skills they have implemented as a result of the group intervention on the rest of the questionnaire. Throughout the in-depth interviews, participants highlighted how the psychoeducation around maladaptive eating patterns helped change how they think about food and eating. This was further portrayed in participants' responses on their feedback questionnaires that highlighted a change in mindset (14

responses out of 38). Furthermore, participants also described implementing some of the skills learnt in the group intervention, which helped them break their maladaptive eating patterns and led to positive behaviour change (24 out of 38 responders). Below are some of the sub-themes encapsulated in this master theme.

3.2.5.3.1 Mindset change

Most participants reported that one of the benefits of attending the group intervention was understanding their relationship to food and their eating patterns better.

> *"I learnt a lot – I feel more confident in knowing why I might binge, how I can try to prevent this and what works well for me as an individual"* Laura- feedback questionnaire

The group psychoeducation provided them with important insights into healthy eating patterns and allowed participants to recognise how to change their current maladaptive eating patterns.

> *"it forced me to recognise like what I was eating. Cause as much as I was unaware, there was also the underlying of I was kind of aware, but I just didn't want to face it, so, in a sense, is making me face what I didn't want to face and knowing that, how my eating habits were wrong. They are still kind of wrong but I'm working on improving them it's, it's not a sprint it's a marathon and Rome wasn't built in a day they say. Yeah."* Mona- interview participant

Some participants reported that the group helped them understand 'slip-ups' as a normal part of the recovery process rather than a personal failure and described how this was valuable in helping them not abandon healthy behaviours altogether when they happened.

> *"Yes, it has helped I know I will slip-up, but it helps me to not punish myself and to know it's okay to start again." Sian* – interview participant

Some participants reported that they learnt to recognise their triggers for binge eating or emotional eating and felt more confident around managing their food intake, which changed the relationship they had with food.

> *"Um, I understand a lot more of what I need to eat, why I need to eat it when I need to eat it. Um, and I know that if I have the urge to binge or if I feel low that I need to do something to stop me from going down that path again. So, I feel like the intake is*

definitely healthier from the plan that I'm doing but also my relationship with food is a lot healthier as well." – Ana- interview participant

3.2.5.3.2 Habit change

In addition to changing the way they think and relate to food, participants further spoke about how they managed to implement the skills learnt in the group intervention to address their maladaptive eating patterns across both feedback questionnaires and the four in-depth interviews. Participants described implementing various techniques, such as regular eating patterns, planning meals, engaging in distraction techniques, not buying unhealthy snacks, which led to a reduction in maladaptive eating behaviours. Most participants described being able to implement positive habits in their life because of the group intervention, with this being further reflected in the in-depth interviews undertaken with some of the participants. Below are some illustrative quotes of this sub-theme.

"I am definitely able to take a lot away from the sessions as I am now able to identify binging and is able to distract myself from it, now that I am eating my three meals and snacks where needed, I find that I no longer feel like I'm starving in the evenings, and I am now able to make better choices and hope to take this experience and also educate others in my family as well." Rita- feedback questionnaire

"Yes, I was frequently missing meals in the daytime and binging at night, now on some/most days I am implementing a regular eating schedule and planning meals, so I have had less binges" Ina- feedback questionnaire

"Yeah, so I have tried, so I've tried to… I have cut out a lot of keeping sweets and things in the house. So, it has helped me with that. And I've also like, I've cut down on fizzy drinks and things. Because I was doing better with it before and then I think I just kind of lost all control of it, and then I started going back to that old habit. But the group kind of reminds me like I'm trying to work towards something, and I need to try and get back into the practice of cutting out these things. Because these are going to be things that are going to be long term, life changing and it's a practice that I need to make as a habit." Bessy- interview participant

"Yes. It's not so much of a big deal for me now, but then I am starting to have regular meals which kills off the binging at night. So that's all it was, to eat regularly. Cause I was never a regular breakfast or lunch eater, and now I'm doing that and making healthier choices when I do actually eat instead of fasting. And I lost some weight!" Rania- interview participant

3.2.5.4 Theme four: Power of systems- what services can do for us

A final master theme emerged from the data surrounding *participants' frustrations and difficulties with the group* and *what services can do to remedy them*. Whilst most participants reported having enjoyed the overall intervention, some participants spoke about some of the difficulties that they encountered in the group. Furthermore, participants also suggested some improvements services can make regarding the group content, facilitation, and structure, with one participant suggesting an additional intervention (body positivity group). As expected, there was an overlap between participants' frustrations and the aspects of the group they suggested improvements on. Below are the two sub-themes that are encapsulated in this master theme.

3.2.5.4.1 Listen to our difficult experiences

Participants relayed the things they struggled with throughout the intervention both in their feedback questionnaires and in their interviews. For example, for a few participants, there was a sense that the group facilitators put a greater emphasis on the presentation and did not always adapt to the group's needs when there was an interest for more in-depth information for a particular topic, such as body image.

> *"I felt that some of the, some of the things that people might have wanted to have discussed in the group were a little bit brushed over and I guess it's, it's like a, like a wound you pick a scab, and you know all the stuff resurfaces"* Ana- interview participant

> *"There was a lot of explaining of certain slides, where we could have had more time to share our experiences."* Mirna- feedback questionnaire

Some participants reported having felt frustrated that there was too little time to interact and they at times felt spoken at rather than engaged in the presentation. Two participants also mentioned finding it difficult when other participants did not engage in the group discussion.

> *"But, I also feel that I felt it was mostly like just spoken at and the interaction that we did take, ahm, and I mean I know it's limited time, but I just feel that the group itself, the other participants, participants was partly interactive than I wanted it to be…"* Bessy- interview participant

> *"sometimes the group was not vocal if I had a question or wanted feedback from people other than the moderators"* Ina- feedback questionnaire

One participant reported that the group presentation lacked colour, and this made it hard for them to follow, whilst another spoke about finding it hard to sit in one place for such a long time.

> *"Presentation is… like the information is there, but it's so like boring to look at because it's just, it's just like […], I like to see colours and stuff that makes the information sink in more for me. You don't know what people, some people might have different disabilities and stuff so like where I'm dyslexic for me, looking at information, mostly in black and white it's just, I'm listening, but it makes me hard to focus on what's going on in the screen" Bessy*- interview participant

There were a few participants that reported difficulties with the timing of the intervention, internet connection or microphones not being muted, whilst others found the questionnaires either too long, repetitive or some questions being irrelevant to them.

> *"Enforcing the rule of being on mute. It was hard to hear and concentrate at times due to background noise from some classmates." Ieva- feedback questionnaire*

> *"What was less helpful about the group?*
> *Repetitive form filling"* Beatrice- feedback questionnaire

Some also struggled with the brevity of the intervention feeling that they were left with difficult emotions at the end of the group or that it was only at the end of the intervention that everyone felt more comfortable sharing their difficulties.

> *"The subject matter is difficult, hence why the group should have been much longer. Being left with difficult feelings at the end of each session has been challenging."* Mirna- feedback questionnaire

3.2.5.4.2 Listen to our suggestions for improvements

While most participants reported having had a positive overall experience of the group intervention, they offered suggestions for improvements around things they struggled with throughout the intervention. They made suggestions around improving the content of the intervention, making this culturally sensitive, particularly around topics such as body image and diet. Participants also suggested that the group cover aspects surrounding bariatric surgery and dietary advice for post-surgery.

"but I don't feel that there was enough information about what happens after the operation […] I think it should have included like ha-, some more examples, as well as how different it maybe prepare yourself before and after and, especially, because we all come from different cultures, so what fits the stereotype isn't gonna, isn't gonna suit us all."

"Well, I was saying to them like the whole-body image thing. Like, [giggles] if it's to me it's still based on culture." Bessy- interview participant

"It need to be more informative about the surgery […]."- Ariana- feedback questionnaire

Furthermore, regarding the group content, a couple of participants highlighted this was focused on binge eating and suggested a more balanced content across maladaptive eating patterns.

"But and I'm not that, I'm not…I don't binge eat to that extent. And so, I feel like there's other aspects of… the ways that people eat that could've been explained a bit more, but it was just like binge eater, binge eater and it's just like: I don't fit into that category [laughter] or to myself I don't fit into that category." – Bessy- interview participant

"Obviously, well like binge and purge that isn't really necessarily relatable to me. So, some aspects of it, I didn't find very useful." Mona- interview participant

There were also suggestions for the group content to offer more information on topics such as body image and self-compassion that are such prevalent issues in this participant population, whilst removing topics such as anorexia and bulimia when they do not apply to any group members. One participant even suggested adding a body positivity group.

"I think there's a lot of things around body image and diet, and I know that's not what the group was about, but it's kind of interlinked. And, um, yeah, I felt like obviously reading other people's opinions sort of looking as they were doing a group as well, it was quite evident that for a lot of people wanted some more content relating to that and" Ana- interview participant

"When it comes to certain aspects of it that might not necessarily be relevant to the group, maybe just find out a little bit about who each individual person is and maybe what their history is, then maybe then you can. When it comes to things like

questionnaires and certain aspects of the slideshows you might not necessarily put input there, you can just leave certain things out or add something else that is more relevant to the group" Mona- interview participant

A few participants struggled with the length of the questionnaires and suggested that these be sent in advance of the session. They also suggested making it more evident at the start of the questionnaires the period of time participants should refer to when answering the questions and offering them more options or the ability to skip questions that are not relevant to them

"*Oh gosh, the questionnaire went on forever. I think the questionnaire could have been something that they certainly send in advance and gave us a time and date they, they needed to be done by […] Um… But I still feel some of them questions were not relevant either, and stuff"* Bessy- interview participant

Participants also made suggestions about group facilitation. For example, a couple of participants suggested that facilitators encourage participants to interact more and make the process more fun and enjoyable, rather than tokenistic in its delivery. There was also a suggestion to start the group with a short ice-breaker exercise to allow participants to feel more involved and get to know each other before sharing sensitive on topics such as their eating patterns and relationship to food.

"The presentation it's so like just a normal presentation and I think if it was a bit more, done in more of a fun sort of way, maybe like an interactive presentation as well, that might make people, maybe laugh a little bit more and open up a little bit more and get them, maybe answering more questions. But it just, it just, it was quite rigid. Yeah!"- Bessy- interview participant

Concerning the delivery of the intervention, some participants suggested that a face-to-face intervention would have increased the level of interaction and bonding between them. Others, however, felt that attending the group online even after the pandemic might be more suitable for some individuals due to issues such as childcare or work. There were also other practical suggestions, such as enforcing the group rules (muted microphones) and encouraging participants to continue engaging as a group after completing the intervention for further support.

"Yeah and maybe, they should give people the choice of, um, do an online or meeting in person, cause some people might prefer it online and then others prefer to meet in person." Bessy- interview participant

"I really liked the interaction; I would love to have done it in person but understand due to the world at the moment it couldn't be helped." Sian

The most frequently and prevalent suggestion for improvement was, however, regarding the length of the intervention. Most participants suggested they needed a longer intervention as this would allow them to build rapport with group members and consolidate the improvements they made to their eating patterns. Others suggested monthly check-ins at the end of the four-week intervention to follow-up on participants' progress, whilst some suggested an increase in session frequency. There was a sense that having more sessions would allow participants more time to interact as well as an opportunity to cover topics in more depth. One participant suggested the intervention should also be offered after the surgery.

"More time - not longer sessions, but maybe more sessions? It feels like we just started getting in the swing of things and opening up when they finished!" Diana- feedback questionnaire

"Making the course longer, 4 weeks isn't enough time" Lorena- feedback questionnaire

"Monthly check back ins to see how I and others are getting on" Victoria- feedback questionnaire

"The subject matter is difficult, hence why the group should have been much longer." Mirna- feedback questionnaire

"I would have loved, I would have loved it to have been, been a bit longer than four sessions. Me personally, I think I would have gotten a lot more out of it if it's for longer." Mona- interview participant

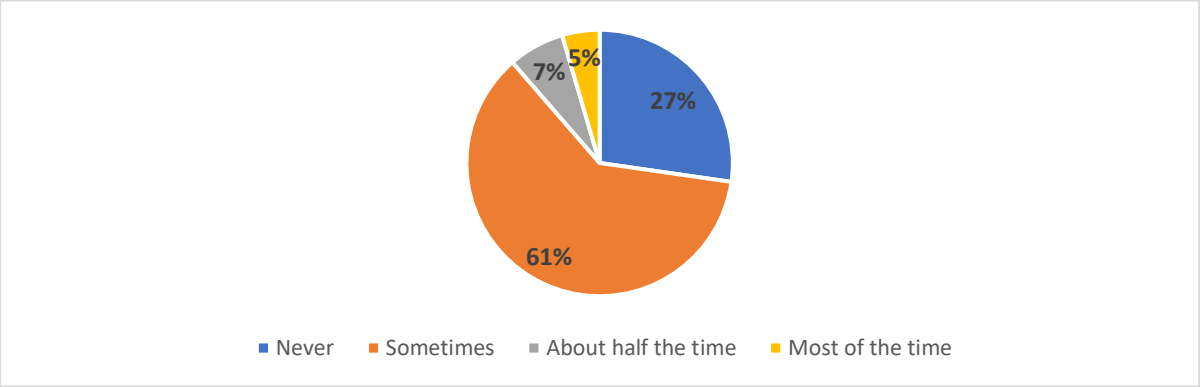
"Maybe two more weeks to make maybe six weeks because it took us on, but then online, because it took us to the fourth week before other people started opening up a bit more. And that was the end of it, whereas maybe if we had an extra two weeks we'd have a bit more of a bonding. I think if you're in a … yeah, I think, maybe six weeks because it gives you a bit more time to build more rapport with people. Because, even if you do like a short course it's normally for like four or five weeks, six weeks anyway." Bessy- interview participant

3.2.5.5 Likert scale questions- feedback questionnaire

All 40 participants completed the three Likert scale questions at the end of the feedback questionnaire. Participants were asked how frequently they practised the skills learnt in the group between sessions. Overall, most participants stated that they were able to practice the skills learnt at least sometimes between sessions, with a few participants being able to practice more often than this and some not at all, as illustrated in Figure 3.9.

Figure 3.9

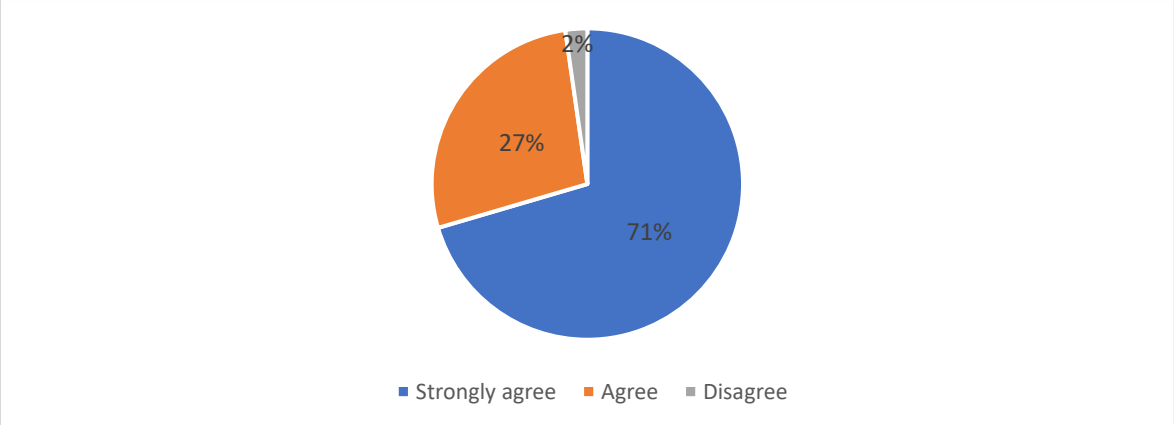
Frequency with which participants practiced skills learnt in the group between sessions



Participants were also asked if they would recommend the group to others with an overwhelming majority strongly agreeing that they would recommend the group to others that need help. Only one participant disagreed and stated they would not recommend the group, as highlighted in Figure 3.10.

Figure 3.10

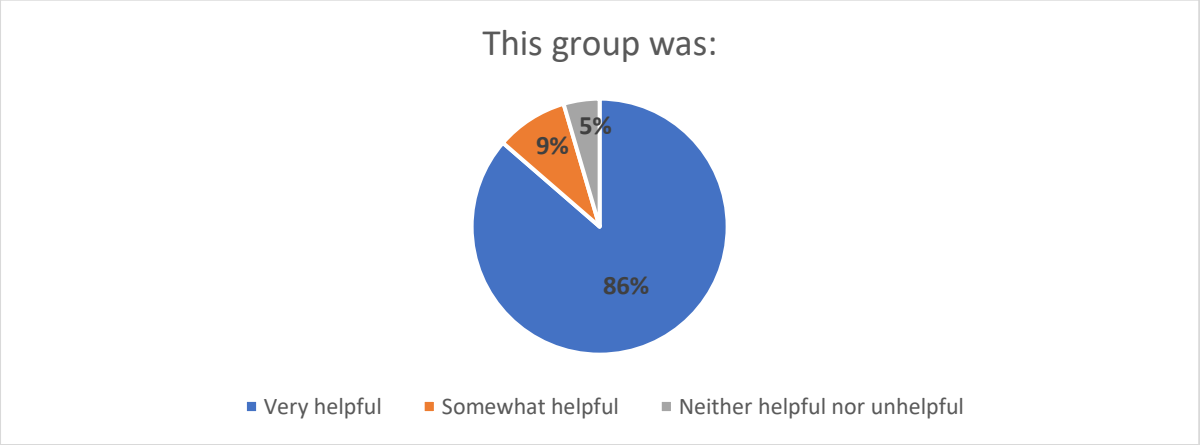
Percentage of participants that would recommend the group intervention to others



Lastly, participants were also asked to provide their overall opinion on how helpful or unhelpful they found the group intervention. Once again, an overwhelming majority of participants (86%) reported having found the group very helpful, with some reporting to have found it somewhat helpful and only 5% reporting to have found the group neither helpful nor unhelpful, as highlighted in Figure 3.11.

Figure 3.11

Percentage of participants that found the group intervention helpful



3.2.6 Qualitative strand- research quality

Throughout the process of conducting the qualitative strand of the study, the researcher adhered to the quality guidelines outlined in the literature (Elliott et al., 1999; Yardley, 2000). Firstly, they made explicit their epistemological and ontological position and included a reflexivity section in which they detailed how their social graces may have impacted the research process. In addition, there was an adequate description of the participant recruitment and sample within the limits of the ethical approval for the study. Further to this, data excerpts were provided throughout the write up to ground the themes in concrete examples. Alongside these data extracts, the researcher appended the initial stages of analysis and text references for each theme. In addition, to ensure the validity of the findings, the research supervisor was offered one interview transcript to scrutinise the raw data from an individual interview (Joffe, 2012 recommend 10% extract) to provide verification surrounding data interpretation. The data extracts provided throughout the results chapter also allowed readers to review the analytic process. These measures ensured the minimisation of biases in the process of data analysis and interpretation. The data was presented in tabular and narrative format to highlight the data coherence, with both master themes and sub-themes being described, and illustrative quotes being offered for each sub-theme.

3.2.7 Summary of findings- Qualitative Strand

The qualitative strand analysis rendered four master themes, Power of the group, Power of Us, Power of Me over Food and Power of Systems, that incorporated ten sub-themes. Overall, most participants reported having found the intervention very helpful and would recommend the group intervention to others who need help with their eating patterns. It transpired from the data that the participants found the group content informative and adequate, yet somewhat overly focused on binge eating and lacking in information regarding other maladaptive eating patterns. Participants further reported having preferred to attend a face-to-face group intervention yet expressed gratitude for having the opportunity to attend the group online during the pandemic. They further suggested that perhaps participants should have the choice of attending the group either online or face-to-face in the future. Participants found several behaviour change techniques helpful in improving their relationship to food, such as cognitive restructuring, distraction techniques, implementing a regular eating pattern, self-monitoring, etc. Most of them reported changes in how they relate to food and an increase in positive eating habits. Participants found the facilitators knowledgeable, compassionate, and non-judgemental. Nonetheless, they reported that the most important relationships were those they made with other group participants, as these interactions were both supportive and normalising of their difficult relationships with food. Participants made several suggestions for improvements regarding the group content, facilitation, and structure.

Chapter 4: Discussion

The current study sought to evaluate a brief CBT-informed group intervention for maladaptive eating patterns in a pre-bariatric sample quantitatively and qualitatively. The quantitative evaluation compared participants' scores on standardised questionnaires across three timepoints: psychological assessments, pre- and post-intervention. It was hypothesised that the group intervention, rather than time alone, will reduce participants MEPs (BES, EE, CR, UE) and secondarily increase their wellbeing (PHQ-9, GAD-7, CIA-3.0). The results highlighted in the previous chapter indicated that the study's main hypotheses were confirmed by the data, except for EE, that was only partially confirmed, and CR. The qualitative evaluation sought to explore participants' subjective experience of attending the group intervention and capture their suggestions for improvement by conducting semi-structured interviews and feedback questionnaires and analysing them using thematic analysis. The following organising themes emerged from the dataset:

1) Power of the Group- *What we liked about the group*

2) Power of Us- *Relationships matter*

3) Power of Me over food- *Improved relationship with food*

4) Power of Systems- *What services can do for us*

The following discussion will integrate and interpret these findings and global themes in relation to theory and existing evidence, discussing their relevance for clinical practice. Furthermore, the clinical implications of these results will be presented alongside methodological issues and suggestions for future research.

4.1 Interpretation of primary quantitative hypothesis with qualitative themes integration

The primary hypothesis of this study sought to investigate whether the brief CBT-informed group intervention had an impact in reducing the maladaptive eating patterns of participants. It was hypothesised that there would be a significant difference in participants' self-reported MEPs across the three timepoints: psychological assessment, pre- and post-intervention. MEPs encompassed the following types of dysfunctional eating patterns: binge eating (BES), emotional (EE) and uncontrolled eating (UE). Initially, the MEPs also included the cognitive restraint levels of participants; however, due to its lack of correlation with some of the above-mentioned variables, it was not possible to include CR in the analysis. Therefore, a separate

ANOVA was conducted to assess changes across timepoints in the levels of cognitive restraint participants reported. The findings of this study confirmed the main hypothesis, with significant differences being found across timepoints in participants' reported MEPs.

Furthermore, it was hypothesised that the BES, EE, and UE would decrease significantly at post-intervention compared with pre-intervention and psychological assessment timepoints, but not between the two later timepoints. Regarding CR, informed by the Cognitive Restraint theory, it was expected participants would present with significant differences at post-intervention, with scores in the moderate range, as compared with pre-intervention and psychological assessment timepoints. However, no significant difference was expected between psychological assessment and pre-intervention timepoints. When exploring these sub-hypotheses further, using univariate analyses, it was found that participants' binge eating and uncontrolled eating patterns decreased significantly at post-intervention compared to pre- and psychological assessment timepoint. No difference was found in participants' binge eating and uncontrolled eating patterns between the assessment timepoint and pre-intervention. This suggests that rather than the passing of time alone, the reported reduction in participants' binge eating and uncontrolled eating patterns is most likely attributable to the group intervention, confirming thus the hypotheses. Participants EE decreased significantly from psychological assessment to pre-intervention and post-intervention timepoint, whilst no such significant differences were found in CR levels across timepoints. In the following sections, each of these findings will be further discussed.

4.1.1 Binge eating (Hypothesis 1.1 - BES)

As mentioned above, there was a significant reduction in binge eating scores following the group intervention, with no such difference being observed before the intervention due to the passing of time alone. In addition, participants' mean binge eating scores fell to the sub-clinical threshold according to BES cut-off scores (<17), suggesting that, on average, participants no longer met the criteria for binge eating following the intervention. When exploring this further, 41% of participants had scores suggesting a moderate binge eating risk at the pre-intervention timepoint and 26% indicating severe binge eating risk. These scores showed that more than two-thirds of the participants presented with a significant risk of binge eating. At post-intervention, these percentages dropped, with only 24.5% of participants indicating the presence of moderate risk of binge eating and 7.5% indicating severe risk of binge eating. Overall, these scores suggested marked improvements, with two-thirds of participants no longer meeting the criteria for binge eating following the intervention. These significant improvements in binge eating patterns were also captured in the qualitative accounts of participants on their feedback questionnaires and interviews. Firstly, participants reported that

the group intervention helped raise their awareness and provided them with information about binge eating. In addition, the psychoeducation provided equipped participants with the knowledge necessary to implement positive new habits (e.g., interrupt restrictive eating-fasting) and the skills required to achieve behaviour change such as regular eating and self-monitoring. There were other behaviour change techniques that participants found beneficial in reducing the frequency of their binge episodes or stopping binge eating altogether. For example, some participants referred to distraction techniques or binge postponement trials, whilst others mentioned mindfulness as helpful strategies in learning to ignore the urge to binge. Overall, they reported having used the psychoeducation and tools learnt in the group to change both their relationship with food and eating habits.

The wider literature supports the findings of the current study in preoperative bariatric intervention. As mentioned in the introduction chapter, four of the preoperative psychological studies have looked explicitly into addressing binge eating in pre-bariatric individuals and used standardised measures to assess the impact of their respective interventions (Ashton et al., 2011; Abiles et al., 2013; Cassin et al., 2016; Delparte et al., 2019). The study by Ashton et al. (2019) reported a reduction in binge eating following the four-week CBT intervention. Researchers also followed-up at one year for the impact of the intervention. They reported that half of the participants no longer met the criteria for BED, with the other half of the participants reporting moderate to severe BED and less weight loss.Similarly to the present study, they only included participants that presented with BED and/or significant MEPs as established following a clinical interview. Furthermore, their group intervention's length and mechanisms of action were similar to those in the current study, as the CBT model and restrained theory underpinned both interventions. Hence, the encouraging yet partial results of Ashton et al.'s (2011) study support the finding of the present research and further suggest that its improvements may be maintained overtime for at least half of this study’s participants.

Further support for this study's findings comes from Abiles et al.'s (2013) research that reported improvements in eating patterns in participants presenting with BED following their attendance of a CBT preoperative psychological intervention. Researchers reported their participants achieved similar results to controls without BED (Non-BED) at post-intervention timepoint and similar weight loss at one-year post-surgery. However, whilst their group intervention included similar mechanisms of action to those in this study, researchers did not include specific BED measures, rather monitored general eating psychopathology.

In addition to the findings from face-to-face interventions, there are also some encouraging results for the preoperative psychological intervention offered via telephone and/or online. In their study, Cassin et al. (2016) reported significant improvements in participants' scores on

BES following an individual, six-session tele-CBT intervention compared with controls. However, it is noteworthy that participants scores at baseline on the BES scale were under the clinical threshold, suggesting only minimal risk of binge eating was present compared to participants in the current study that demonstrated moderate to severe binge eating risks.

Furthermore, their intervention was focused on the CBT model of overeating and did not include tools for binge eating. Nonetheless, the improvements reported suggest that the delivery of psychological interventions remotely may bring comparable results to those delivered face-to-face in a pre-bariatric population. Further support for this claim comes from several other studies investigating online/telephone interventions for BED in the general population and individuals living in larger bodies (Wells et al., 1997; Jones et al., 2008; de Zwaan et al., 2012; Wagner et al., 2016; Munsch et al., 2019; Jensen et al., 2020) that showed comparable improvements in participants' BED levels as face-to-face interventions.

More specifically, concerning the delivery of an online intervention in the pre-bariatric literature, Delparte et al. (2019) reported improvements in participants' BES scores between baseline and four months follow-up, but not post-intervention, as compared to TAU participants following an online DBT-informed intervention. These results suggest that individuals in the treatment arm may have needed time to consolidate the information and skills offered in the group before showing marked improvements in binge eating. However, in their study, on average, participants in the DBT arm presented with BES scores that indicated a slight, moderate risk of binge eating whilst those in the TAU group only presented with minimal risk of binge eating. An important point to consider is that participants were not clinically assessed for the presence of BED or MEPs prior to their inclusion in the study. Arguably, whilst the intervention provided was targeted to a specific population, their inclusion criteria did not reflect this. Hence, it may be that the online DBT-informed intervention may have shown different results in individuals that were identified to present with eating psychopathology following an assessment.

Additionally, in contrast to the present study, Delparte et al. (2019) used a DBT informed intervention to target general eating psychopathology primarily informed by the emotional regulation model and theories. Hence, the lack of significant differences reported at post-intervention in their study might also be on account of the different mechanisms of action included in their intervention. Researchers reported a focus on emotional regulation, distress tolerance and mindfulness skills without necessarily addressing the physiological factors of binge eating and/or maladaptive eating such as regular eating, meal planning etc. The findings in the qualitative strand of the present research study highlighted the latter as the most valuable mechanisms of action of the online group intervention by participants. Hence

this potentially explains the lack of improvement reported following the online DBT-informed intervention, which did not include these mechanisms. Taken together, these findings may present clinical implications for practitioners designing interventions for this client population, as they highlight the importance of including mechanisms of actions that target the physiological factors of MEPs.

4.1.2 Uncontrolled eating (Hypothesis 1.2 – UE)

Further to binge eating, this research study was interested in whether the brief CBT-informed psychological intervention would be successful in reducing the uncontrolled eating of pre-bariatric individuals, given that this is one of the defining criteria of BED and that it was associated with poorer weight-loss post-surgery (Colles et al., 2008). As previously mentioned, there was no difference observed between psychological assessment and pre-intervention timepoints for participants' UE levels, whilst a significant reduction was found between these two timepoints and participants' reported UE scores following the group intervention. This suggested that most likely, it is the group intervention rather than the passing of time alone that was responsible for reducing participants' UE. These results align with Gade et al.'s RCT findings (2014), where they reported that a 10-week CBT intervention offered to pre-bariatric individuals significantly reduced participants UE patterns compared to controls. Nonetheless, they reported that differences were not maintained at 1- or 4-year post-surgery follow-up (Gade et al., 2014; Hjelmesath et al., 2019).

However, Gade's (2014) study participants were not screened for binge eating disorder or MEPs using a clinical assessment, rather just a standardised questionnaire TFEQ R-21 (Karlsson et al., 2000), which indicated only moderate CR, UE, and EE at baseline. Therefore, whilst the intervention was targeting dysfunctional eating patterns, the individuals selected to attend the group were not assessed for the presence of dysfunctional eating patterns. Hence, it is plausible to hypothesise that the long-term results may have been different had participants in the study been included based on a clinical assessment of dysfunctional eating. Furthermore, given the significant reduction in UE levels found at post-intervention both in the current research and in Gade et al.'s RCT (2014) and considering that MEPs are a limiting factor to bariatric surgery in the UK, CBT interventions show promising results in preparing pre-bariatric individuals to meet criteria and qualify for surgery. No other studies in the literature of pre-bariatric psychological interventions were found that monitored for uncontrolled eating.

In their qualitative accounts, participants did not use the terminology of uncontrolled eating, which is primarily featured in clinical and/or academic language. Nonetheless, when

deconstructing the meaning of Uncontrolled Eating as measured by the TFEQ-R18V2-R18 (Cappelleri et al., 2009), this looked at capturing the lack of control participants exhibited over the quantity of food they ate, their ability to stop eating when full and control cravings. These aspects of eating were reflected in the statements participants made on their feedback questionnaires and/or interviews.

Some of the participants expressed having found the psychoeducation information and the skills they acquired in the group helpful in changing their mindset and in learning how to control their food intake, confirming thus the quantitative findings. Participants spoke about how the group increased their awareness regarding some of the unhealthy food choices they routinely made and/or their portions sizes and helped inform them how to make better choices. Furthermore, some stated to have reduced their portion sizes. One participant spoke about using a smaller plate, another eating at the table and paying attention to their meal, whilst another participant described learning regular eating and listening to their body and stopping when they are feeling full. To manage their food cravings, many participants cited to have used distraction techniques and/or mindfulness. The qualitative findings aligned with the quantitative results of the study and provided additional information surrounding the mechanisms of actions that participants found helpful in tackling their uncontrolled eating, which are similar to those reported in the literature in pre-bariatric psychological interventions (Ashton et al., 2009; 2011; Cassin et al., 2016; Gade et al., 2014; Paul et al., 2021). This descriptive information may have important clinical contributions for practitioners looking in developing brief psychological interventions for the pre-bariatric population presenting with MEPs.

4.1.3 Emotional eating (Hypothesis 1.3 – EE)

Another aspect of interest in the current study was whether the group intervention would successfully tackle the EE patterns that participants on the bariatric pathway reported before engaging in the intervention. As mentioned in the introduction chapter, EE has been considered one of the most common untreated factors that have a detrimental impact on the outcomes of bariatric surgery (Chesler, 2012), with one study reporting that up to 18% of candidates for surgery presented with clinically significant EE at assessment (Zimmerman et al., 2007). In the current study, although there was a significant difference found in participants' emotional eating pattern between psychological assessment and pre-intervention timepoint (M= 6.8), which suggested time alone leads to significant changes in EE levels, the difference in mean scores between pre- and post-intervention was double that (M= 12.40). In addition, on average, participants waited for 18 weeks from the time they were assessed (psychological assessment) until they began the group intervention (pre-intervention timepoint), whilst the

duration between pre- and post-intervention measures was around 4-5 weeks, which is only a quarter of the waiting time. Arguably, it would be unlikely that the significant difference found between pre- and post-intervention, which was double that between psychological assessment and pre-intervention, can be attributable solely to the passing of time alone.

In addition, several theories have tried to explain the well-established relationship between emotions and food, proposing that some individuals use food to *mask* (Polivy & Herman, 1999) or *escape* (Heatherton & Baumeister, 1991) difficult emotions, or reduce the level of emotional arousal (Pine, 1985). These theories imply that humans may eat to distract from emotions which may offer a sense of immediate gratification and mood improvement, providing with necessary comfort in times of distress which was further confirmed by recent studies showing that the ingestion of large amounts of foods that contain fat and sugar, leads to the release of cannabinoids and opioids in the brain which are the 'soothing' chemicals that help ward off emotional pain (Colantuoni et al., 2002). These theories are particularly relevant to the findings of the current study, given that the entire research project took place during an unprecedented world pandemic. Around 93% of participants were psychologically assessed during the first and second wave of the COVID-19 pandemic in the UK and before the announcement of the vaccine roll-out. Furthermore, only 12 participants out of 44 attended the group intervention before the vaccine roll-out was announced.

Given that individuals living in large bodies were identified to be at higher risk of developing complications when contracting COVID-19, this led to many individuals on bariatric pathways being advised to shield (Flint & Tahrani, 2020). Furthermore, there was an increase in negative media attention on this topic and a stigmatising governmental response (Department of Health and Social Care, 2020), which may have exponentially increased the anxiety and stress in this population. Underpinned by the emotional eating theories above mentioned, it is plausible to suggest that for participants in the current study who were identified as having an excessive reliance on food in response to distressing emotions, their EE scores at psychological intervention were higher in response to the difficult times of the pandemic and the adjustments they had to make in their lives. Therefore, participants' significant reduction in EE scores at pre-intervention timepoint is understandable, given that more than two-thirds of participants attended the group intervention following the announcement of the vaccine roll-out, which presumably may have alleviated some of their anxiety and distress at seeing the end of the pandemic and/or shielding recommendations in sight. Thus, the improvement in mood may have reduced their reliance on food for comfort and, as a result their EE scores. The comfort derived from EE may explain why participants scores on wellbeing measures did not fluctuate similarly, as no significant difference was found on account of the passing of time alone

between psychological assessment and pre-intervention timepoints. It may be that, as mentioned above, the chemicals released as a result of participants increased EE levels helped ward off their emotional pain.

To support this hypothesis, several studies undertaken during the pandemic have highlighted an increase in dysfunctional eating in individuals with higher BMI or those that presented with high EE before the pandemic. For example, in the UK, Branley-Bell and Tablot's study (2020) indicated that individuals recovering from or struggling with eating disorders were at higher risk of increased disordered eating and decreased feelings of control during the first lockdown. Robertson et al. (2021) replicated these findings, which also indicated a negative impact on individuals' body image and exercise levels. More specifically, one study in the UK found that higher EE (as measured by TFEQ-R18V2 R-18; Cappelleri et al., 2009) during lockdown was associated with individuals with a higher BMI (Coulthard et al., 2021). More relevant to the current study's findings, research looking at eating behaviours and physical activity in individuals with obesity during the first lockdown reported that a higher BMI was predictive of greater overeating and lower physical activity, with a lower diet quality. Heinberg and Steffen (2021), in their review, indicated similar studies in other countries. For example, one study in Turkey (Elmacioğlu et al., 2020) showed an increase in CR, UE, and EE during their first national lockdown. The EE also appeared to have increased pre- to post-lockdown for participants in a study from Spain (López-Moreno et al., 2020), with similar trends being reported in Italy for participants on a weight-loss program that reported an increase in eating, particularly unhealthy snacks/sweets (Pellegrini et al., 2020).

However, these studies were largely based on retrospective data gathered using an online questionnaire from individuals recruited via social platforms. Thus, it is hard to generalise their conclusions due to their weak methodological validity. One example of how data from such studies may be skewed comes from Keel et al. (2020). Their prospective study found that whilst undergraduate students perceived and reported weight gain due to the COVID-19 lockdown, neither their weight nor BMI significantly changed over time when objectively measured. Furthermore, in the NutriQuebec cohort study (Lamarche et al., 2021), the opposite was found, as individuals with obesity reported improved dietary quality during the COVID-19 lockdown. Whilst the literature presents mixed findings, most studies suggest an association between individuals with higher BMI and an increased EE or overeating during the first lockdown.

Regarding the significant reduction in participants' EE levels observed following the group intervention, several studies in the preoperative psychological intervention literature support the findings of the current research. One such study comes from Cassin et al. (2016) that

reported that following their tele-CBT intervention, they observed a reduction in EE levels as compared with controls. Similarly, both Gade et al.'s (2014) and Paul et al.'s (2021) studies report in their pre-bariatric RCTs a reduction of EE levels as compared with controls following a CBT group intervention, yet this was not maintained at one year follow up (Hjelmesaeth et al., 2019). Delparte et al. (2019) reported that following their online DBT-ST group intervention, participants reported a similar reduction in EE levels as compared with controls at four months post-intervention. Further support for the quantitative results comes from the qualitative accounts participants gave. They spoke about how the group intervention provided psychoeducation information that helped raise their awareness around the energetic input their body needs and how to distinguish between physical and emotional hunger. Some participants reported that implementing regular eating and self-monitoring supported them in making this distinction by having an objective framework to return to when they felt hunger or cravings. To overcome emotional eating, in their interviews, participants talked about implementing distraction techniques and mindfulness. The topic of emotional eating featured less in participants comments, given that no specific questions were using this language or inquiring about such changes. It is also possible that this may reflect the group content, as participants highlighted that the group was primarily focused on BED and less on other types of MEPs.

4.1.4 Cognitive restraint (Hypothesis 1.4 – CR)

Regarding participants' Cognitive Restraint levels, no significant differences were found across the three timepoints, with only an increasing trend in mean scores between psychological assessment, pre- and post-intervention being observed. Nonetheless, in alignment with the Cognitive Restraint theory (Herman & Mack, 1975) that underpins the gold standard CBT treatment for BED (NICE, 2017), the group aimed at promoting a moderate level of cognitive restraint which some studies have found to be an optimal level in individuals struggling with maladaptive eating patterns (Fairburn & Brownell, 2005; Fairburn & Wilson, 1993). Hence, when participants reported a mean score in the moderate range at psychological assessment and pre-intervention timepoint, this was expected to be maintained at post-intervention timepoint. However, there was a discrepancy between participants self-reported Cognitive Restraint scores that remained in the moderate range and their self-reported Binge, Emotional and Uncontrolled eating patterns that decreased significantly at the post-intervention timepoint. Whilst this may at first raise questions on whether CR holds any relevancy in the fabric of maladaptive eating patterns for this client population, it is worth pointing out that the sample of participants for the present study included both individuals with BED and individuals presenting solely with uncontrolled grazing, overeating and/or emotional eating.

More specifically, the Cognitive Restraint theory (Herman & Mack, 1975; Polivy & Herman, 1985) that underpins the transdiagnostic model of Eating Disorders (Fairburn et al., 2013) posits that disruption of restrained eating results in overeating/binge eating, with individuals, that binge eat presenting with high CR punctuated by periods of disinhibition (low CR), whilst individuals that overeat present with low levels of CR. Nonetheless, the relationship between restraint eating and maladaptive eating behaviours has not been clearly established as some studies have found a clear link in support of the restraint theory (Fairburn et al., 1998; Grilo, 2001, Fairburn & Brownell, 2005; Polivy & Herman, 1985; Wilson et al., 1997; Neumark-Sztainer et al., 2006), whilst others have not (Marcus et al., 1985; Mitchell et al., 1986; Lowe, 1993; Lawson et al., 1995; Haiman & Devlin, 1999). Notably, concerning individuals living in large bodies, some literature suggests that dietary restriction precedes the onset of BED (Gormally et al., 1982), whilst others suggest that binge eating precedes dieting (Wilson et al., 1993), with other studies highlighting no connection between cognitive restraint and binge eating severity (Marcus et al., 1985). At first glance, the results of the current study align with the latter.

Nonetheless, informed by the Cognitive Restraint theory when looking at the sample composition of the present study, we would expect that participants' scores on the CR subscale may fall predominantly into two categories at both psychological assessment and pre-intervention timepoints. More specifically, participants presenting with BED would have reported either high or low CR levels, and those who presented with uncontrolled grazing, overeating and/or emotional eating would have reported low-level CR before receiving the intervention. Indeed, when exploring the distribution of scores at psychological assessment on the CR subscale, it was observed that 49% of participants presented with low-level CR and 23 % with high CR, showing that two-thirds of participants did not have scores in the moderate range. This pattern was maintained at pre-intervention timepoints, where 49% of participants reported low CR levels whilst 28% of participants reported high CR levels. When comparing these distributions with the post-intervention distribution of CR scores, it was observed that more than half of participants reported scores in the moderate range following the group (54%), with only 28% of participants presenting with CR scores in the low range and 17% in the high range. Hence, illustrating that whilst the mean scores between psychological assessment, pre-intervention and post-intervention did not significantly change, the distribution of scores around the mean did change. This suggests the group intervention improved participants CR levels by increasing restraint in individuals with low CR and decreasing restraint in individuals with high CR. These findings reflect the wider debate in the literature surrounding the central limit theory (Field, 2013) that underpins parametric tests.

This hypothesis also gathers support from participants' qualitative accounts on their feedback questionnaires and interviews. The majority of participants spoke about the fact that implementing a regular eating pattern and planning their meals were the most useful strategies in overcoming their MEPs. Some participants reported this to have helped cut down on their uncontrolled grazing and/or stress eating (low CR), whilst others reported this helped them distinguish between the physical and emotional sensation of hunger in deciding to eat or restrain from eating, with others reporting managing to reduce binge eating/overeating by eating regularly and not skipping meals. These accounts support the observations of the changes towards moderate range scores in the distributions of the CR scores around the mean from psychological assessment and pre-intervention to post-intervention timepoint.

Nonetheless, in the pre-bariatric population, a study by Sarwer et al. (2008) found that higher cognitive restraint, as measured by the original scale of the TFEQ (Stunkard & Messick, 1985), predicted better weight-loss post-surgery. Based on these findings, researchers suggested that pre-bariatric interventions should aim at increasing the baseline CR levels of candidates to improve post-surgery outcomes. However, there is no mention of whether participants in their study presented with binge eating disorder or only dysfunctional eating patterns. Therefore, it would be essential to know the composition of their sample to generalise their conclusions to the entire pre-bariatric population. In their RCT, Gade et al. (2014) also reported that at post-intervention, their participants presented with significantly higher CR levels, as measured by the TFEQ-21 (Karlsson et al., 2000) and lower EE and UE. Based on Sarwer's study, they concluded this was an improvement of participants' dysfunctional eating patterns. Similarly, to Swaer's study no information was provided as to whether participants in their sample presented with BED. Whilst media and some health practitioners often promote highly restrictive diets for individuals with obesity; recent research has shown that such interventions may be harmful at both a psychological and physiological level (de Witt Huberts et al., 2013).

Overall, the findings of this study suggest that the brief CBT-informed group intervention was successful in significantly reducing the MEPs of participants on a bariatric pathway and enabling them to meet the NHS criteria and qualify for bariatric surgery (NICE, 2014). Given the lack of a control group in the present study, the psychological assessment timepoint was introduced to help assess whether the changes found in participants' MEPs were due to the passing of time alone or the group intervention. As argued in the above paragraphs, the findings of this study were supported by the broader pre-bariatric literature and theories and indicated that it was the group rather than time alone that had an impact in reducing MEPs. Evidence for this also came from participants qualitative feedback questionnaires and

interviews. They described various behaviour change techniques that supported them in improving their dysfunctional eating, such as: implementing self-monitoring, regular eating, distraction techniques and mindfulness. These results were further supported by qualitative studies in weight management interventions or post-bariatric interventions (Tarrant et al., 2016; Santiago et al., 2021).

4.2 Interpretation of secondary quantitative hypothesis with qualitative themes integration

Literature has presented with mixed findings surrounding the impact of prior mental health problems on outcomes of bariatric surgery, with some suggesting poorer outcomes (Kinzl et al., 2006; Kalarchian et al., 2008) whilst others reporting no detrimental impact on surgery results (Black et al., 2003; Herpertz et al., 2004). Furthermore, several studies have suggested that binge eating is associated with depression in the general population (Araujo et al., 2010) and in individuals living in larger bodies, where it was sometimes found to precede low mood (Mussell et al., 1995). Hence, as a secondary aim, this current study investigated whether participants' Wellbeing would improve following the brief CBT-informed intervention due to an improvement in their MEPs. It was hypothesised that there would be a significant difference in participants' Wellbeing scores (PHQ-9, GAD-7, CIA-3.0) across the three timepoints. It was expected that participants' PHQ-9, GAD-7, and CIA-3.0 scores would significantly decrease at post-intervention compared with pre-intervention and psychological assessment timepoint. However, no such difference was expected between the two latter timepoints on these measures. Whilst, it was not possible to analyse the combined variables: depression (PHQ-9), anxiety (GAD-7) and psychosocial impairments secondary to eating disorder features (CIA) due to the latter not being normally distributed, individual analyses confirmed our hypotheses. Participants' mood, anxiety, and quality of life as related to eating disorder features were shown to have significantly improved following the intervention and not prior to this, indicating that it is most likely the group intervention and not the passing of time that was responsible for the improvements reported across wellbeing measures.

These findings are aligned with the pre-bariatric psychological interventions literature where all studies that monitored for participants' wellbeing pre- and post- psychological intervention found an improvement in mood, anxiety and/or quality of life at post-intervention (Liu et al., 2016; Kalarchian et al., 2015). Nonetheless, as previously mentioned, the literature review of these studies highlighted heterogeneity across the types of interventions offered, their aims and the measures employed. Some interventions looked primarily at improving candidates' mood and motivation to engage in lifestyles changes and/or surgery. These three studies employed different models in their group interventions, such as the Thematic-Interactional

group (Wild et al., 2011), Behaviour Therapy (Brandenburg & Kotlowsky, 2005) and CBT (van Der-Hofstadt et al., 2012). Given the primary aims of these interventions, researchers prioritised specific mechanisms of action to address mood and motivation (behaviour activation, motivational interviewing), which were not as prevalent in the intervention investigated in this study. Therefore, whilst they reported similar significant improvements in mood, anxiety, and motivation, it is difficult to draw parallels between their findings and those reported in this study due to the differences in interventions.

The most significant support for the findings of this research comes from pre-bariatric literature studies that specifically targeted participants' dysfunctional eating in their interventions and secondarily monitored for mood, anxiety, and quality of life (Ashton et al., 2009; 2011; Abiles et al., 2013; Cassin et al., 2016; Gade et al., 2014; Delparte et al., 2019; Paul et al., 2021). All six studies reported improvements at post-interventions in mood, anxiety and/or quality of life adjacent to the significant reductions in MEPs. However, for the two studies that followed participants long-term, these significant improvements did not appear to be maintained over time compared with control groups. In addition, different measures for quality of life were used across the preoperative psychological interventions literature, with some looking at general quality of life (WHO Quality of Life- Paul et al., 2021; Mental Quality of Life, SF-3 Wild et al., 2011) others using non-standardised measures (Caniato & Skorjanec, 2002) whilst others measured quality of life as related to disordered eating features (such as CIA-3.0; Gade et al., 2014) as is the case in the current study. Regardless of the heterogeneity in measures used to assess changes in quality of life, improvements were reported across all studies following psychological interventions. These findings are aligned with those observed in the present study.

Furthermore, all but one of the above-mentioned studies (Delparte et al., 2019) offered interventions based on the CBT model. Therefore, there was a great overlap between their mechanisms of action and those included in the intervention of this study. Whilst psychological interventions across pre-bariatric studies were of different lengths, and most of them were offered face-to-face, it may be plausible to conclude based on the similarity of findings, that in general, participants' Wellbeing improves as a result of a reduction of their MEPs following attendance of a pre-bariatric psychological intervention for MEPs.

Additional support for the reported findings of the quantitative strand comes from the qualitative accounts of participants. Whilst participants were not asked specific questions on their interview or the feedback questionnaires concerning changes in their general Wellbeing; some participants referred to this. Two participants denoted an improvement in confidence due to attending the group, with others reporting feeling more in control of their food and more

relaxed around mealtimes. Several studies highlighted that stronger internal health locus of control beliefs are associated with greater life satisfaction and quality of life (Strudler Wallston & Wallston 1993; Rogowska et al., 2020) which is compatible with the present findings. One participant reported having found the skills learnt in the group helpful in improving their anxiety levels. Other mechanisms of action that participants mentioned in their feedback questionnaires were mindfulness and self-compassion practices. One participant described on their feedback questionnaire to have found the group helpful in managing the cycle of blame and shame around their 'slip-ups' with eating, with self-compassion being an important tool in helping them return to regular eating following these 'slip-ups'. An overwhelming majority of participants mentioned the importance of the group in normalising and validating their experiences. They further mentioned facilitators' role in creating a non-judgemental, safe group, which they reported helped increase trust and tackle their shame around their eating patterns. These statements indicated several mechanisms of action for which ample literature exists to support their role in improving mood, anxiety, and psychosocial impairments due to disordered eating features. These are aligned with qualitative research findings on weight management programmes in Tier 3 services (Tarrant et al., 2016)

More specifically, given the prevalence of weight stigma in our society and its deleterious impacts on the physical and mental wellbeing of individuals living in larger bodies (Puhl et al., 2020), the group intervention evaluated by this study included tools from third-wave CBT approaches such as CFT and Mindfulness. CFT was developed to support individuals with high levels of shame and self-criticism (Gilbert 2010). In regard to its effectiveness in individuals living in larger bodies and/or struggling with disordered eating patterns, there is some preliminary evidence to support this. For example, findings from an intensive CFT intervention targeting weight stigma in a group of women with *overweight* and *obesity* have shown significant improvements in psychological distress, eating self-efficacy, body dissatisfaction and shame post-intervention and at 3-months follow up (Forbes et al., 2020). Furthermore, preliminary evidence of integrating CFT in CBT for eating disorders has also shown positive results (Goss & Allan, 2014; Gale et al., 2014; Kelly & Carter, 2015), particularly in addressing the high levels of shame and self-criticism and their contribution to the disordered eating pattern. Hence, it may be that in the case of the current intervention, the introduction of self-compassion strategies may have had a positive impact not only in reducing participants weight stigma but in actually improving their mood and their ability to return to a healthier lifestyle following binge eating/overeating episodes without shaming/blaming themselves.

In addition, participants mentioned the value of Mindfulness practices. To date, there is ample evidence of the effectiveness of mindfulness on improving mood and anxiety (Segal et al., 2018; Teasdale et al., 2000; Fjorback et al., 2011; Gu et al., 2015). In the pre-bariatric population, one study was identified in the present literature review that integrated one hour of mindfulness practise into a CBT group intervention targeting weight-loss and treatment adherence (Lier et al., 2012). Researchers reported improvements across mood and anxiety at post-intervention. Further studies have also shown the benefits of integrating mindfulness in CBT interventions and its impact on changing obesity-related eating psychopathologies such as binge eating (Baer et al., 2005; Leahey et al., 2008; Courbasson et al., 2010; Kristeller et al., 2014), external (Alberts et al., 2012; Woolhouse et al., 2012) and emotional eating (Leahey et al., 2008, Alberts, 2012; Woolhouse et al., 2012). Therefore, the findings of this research support the previous literature and highlight the potential dual role of mindfulness practices integrated into the treatment of MEPs to help participants learn to manage cravings and help improve their mood.

Further to self-compassion and mindfulness, the qualitative analysis rendered the theme *Power of Us- Relationships matter* as one of the most important aspects of the group intervention. As mentioned above, participants highlighted the importance of sharing their stories with other group members. Given that the group intervention in the present study took place during the COVID-19 pandemic, it may be that the power of relationships was amplified on account of the impact the pandemic had on participants' lives. Furthermore, studies across the pandemic have highlighted the detrimental impact of social isolation and loneliness on Wellbeing, particularly for those who needed to shield (Sisto et al., 2021; Brown et al., 2021; Athanasiadis et al., 2021). Therefore, it is plausible to suggest that the improvements in wellbeing participants reported were perhaps also related to the reduction in isolation and the opportunity to interact with others. A more detailed discussion of this research study's qualitative findings will be provided in the below paragraphs to better capture participants' experience of the group intervention.

4.3. Discussions of Qualitative findings

4.3.1 Power of the group and Power of Me over Food

The two main themes discussed in the above paragraphs, *Power of the Group* and *Power of Me over Food,* subsumed most of the qualitative accounts of participants that supported the quantitative findings of this study regarding improvements in MEPs and Wellbeing following the group intervention. Overall, participants mentioned how they used the psychoeducation information and skills learnt in the group intervention to change the way they think and/or relate to food and their dysfunctional eating patterns. They further described feeling more confident

in controlling their food intake following the group intervention. In addition, some participants indicated using some of the tools learnt to manage their anxiety levels. Apart from psychoeducation, participants referred to several mechanisms of action such as: implementing regular eating, self-monitoring food diary, distraction techniques, binge postponement trials, mindfulness, and self-compassion. These accounts were shown to be compatible with previous studies in the pre-bariatric population (Ashton et al., 2009; Cassin et al., 2016; Gade et al., 2014; Paul et al., 2021) as well as eating disorder studies (Fairburn et al., 2013) that describe the inclusion of similar mechanisms of actions in their interventions in order to achieve behaviour change in eating patterns and/or mood. Furthermore, in support of these findings, Brandenburg and Kotlowsky (2005) also reported that participants had found their preoperative group intervention informative and helpful in changing their eating behaviours post-operatively. However, there were no qualitative studies found that captured participants' experience of pre-bariatric psychological interventions.

4.3.2 Power of Us- Relationships Matter

The most surprising finding from the qualitative data is the significance participants gave to their relationships with other group participants, which was reflected in the master theme *Power of Us- Relationships matter*. Most participants mentioned group interaction and interpersonal group relationships as their favourite parts of the intervention. Furthermore, their accounts indicated several therapeutic processes that were found to enable therapeutic change in group psychotherapy (Yalom & Leszcz, 2020), which will be discussed below.

Firstly, there was a strong sense of normalisation brought on by the comfort participants received from recognising that other people had similar struggles with food. The principle of normalisation participants referred to was surprised as an essential therapeutic process to effective group psychotherapy (Yalom & Leszcz, 2020). Participants further referred to a sense of belonging to the group, feeling that everyone was working towards similar goals and supporting each other along the way without judgement. This bonding process achieved in the brief group intervention reflects the construct of group cohesion that Yalom and Leszcz (2020) suggested being a crucial therapeutic factor in enabling changes in group therapy.

Participants mentioned having found it helpful to share information with one another, feeling empowered to exchange ideas regarding their similar struggles with implementing healthy behaviours. The participants' accounts indicate the presence of multiple group mechanisms of actions: imparting of information, socialisation, and imitative behaviours (Yalom & Lescz, 1995). Further references were made regarding the mutual, and non-judgemental support participants showed one another. In her interview, Bessy reflected on one example in which

the group supported a group member struggling with body image issues in changing her negative self-evaluations. These examples offer evidence of the presence of altruism within the group, which Yalom and Leszcz (2020) found to be an essential group process that contributes to improving the wellbeing of group participants.

Within this master theme, participants gave accounts of feeling more confident around food and their ability to change their eating patterns seeing that they are not alone in their struggles. It is thus possible that the installation of hope in their capability to change their dysfunctional eating behaviours (Mitchie et al., 2014) may have occurred at the intersectionality between group processes and the knowledge and skills received from facilitators (Yalom & Leszcz, 2020). Participants further mentioned facilitators' role in creating a non-judgmental, safe atmosphere that other group members modelled. Given the prevalence of weight stigma in society, this corrective experience may have provided participants the safety to try out new coping strategies without fear of judgement from others.

All of the above-mentioned group mechanisms of action were born from the relationships participants formed with one another. Literature reports these group processes to be responsible for effecting behaviour change in group psychotherapy (Yalom & Leszcz, 2020). While some researchers suggest that most group CBT interventions are based on individual treatment protocols and thus are less likely to incorporate these processes, participants accounts in the current study suggest this was not the case. These group processes featured as potent subthemes under the *Power of Us* master theme. Furthermore, there has been a wealth of evidence to support the role of these group processes in CBT group interventions (van Andel et al., 2003; Bieling et al., 2009; Taube-Schiff et al., 2007). An important point to consider is that the intervention investigated in this study was not group therapy but rather a brief psychoeducational group informed by the CBT model and its third wave approaches. Thus, the qualitative findings indicating the presence of such group mechanisms of action in this brief intervention are even more encouraging.

As mentioned previously, the prevalence and importance of this particular theme may have been augmented by the circumstances in which the group intervention occurred. As previously mentioned, all seven cycles of the group intervention took place online in response to the COVID-19 pandemic, which had a detrimental impact due to social isolation, increasing rates of loneliness, low mood, and anxiety in the population (Sisto et al., 2021; Heinberg & Steffen, 2021). It is, therefore, possible that belonging to a group in these uncertain times was of even greater importance in alleviating the feelings of isolation and loneliness participants on a bariatric pathway may have been experiencing. Future mixed-methods studies would be required to shed light on the findings of the current study.

4.3.3 Power of Systems- What services can do for us

An important aim of the qualitative strand was to capture participants' suggestions for improvements following their attendance of the brief CBT-informed group intervention for MEPs. These were subsumed under the master theme *Power of Systems- What services can do for us* with its two subthemes *Listen to our difficulties* and *Listen to our suggestions for improvements*. As expected, there was a great overlap between what participants struggled with during the group and their suggestions for improvements in the group intervention.

Some participants spoke of technical challenges in attending the group intervention, such as internet connection difficulties, other participants not muting themselves, difficulties in taking time off work to attend the intervention. A few participants reported that having the intervention face-to-face may facilitate better connections between group members; however, most found the online delivery acceptable and further suggested that following the pandemic candidates to bariatric surgery should be given the choice of attending either an online or face-to-face intervention. There were also suggestions made surrounding the group content in their feedback questionnaires and interviews. Participants commented that the group content would need to be culturally updated and include more information on bariatric surgery. The latter may be due to the fact that the bariatric service resumed all bariatric psychoeducation during the pandemic. Some participants reported that the group intervention overly focused on binge eating and suggested a more balanced approach to covering MEPs. There were also reports from participants on the need for a more flexible approach to the group protocol, where facilitators can adapt the information to the needs of the group members. Some participants reported wanting more in-depth information on some topics that were only lightly covered (e.g., self-compassion, body image), whilst others spoke of the group including irrelevant information such as purging and anorexia.

The two most significant improvements participants suggested were regarding increasing the length of the group intervention alongside the time participants had to interact in the group. As mentioned, participants found the relationships they formed with one another to be the most beneficial aspect of the group intervention. Nonetheless, most of them reported wanting more time to socialise and share information with one another. These findings suggest that the CBT intervention in the current study may benefit from incorporating a more relational approach alongside the psychoeducation information and skills it offered, to provide individuals with new corrective relational experiences. This is further supported by the literature, with Bieling et al. (2009) suggesting that CBT group interventions may benefit from integrating more emphasis

on group process to enable more effective behavioural changes and better group experience for participants.

Regarding the length of intervention, most participants reported they needed more time to practice their new healthy behaviours and consolidate the new information they received. In addition, participants believed that having a more extended group intervention may afford them more time to interact and bond, as well as an opportunity to cover aspects of interest in more depth. In their responses on the five-point Likert scale questions, more than half of participants reported having practised the skills learnt in the group at least sometimes between sessions, with only 5% reporting to have practised the skills most of the time. Concerning participants overall evaluation of how helpful they have found the group, 95% of them reported to have found the group very helpful or somewhat helpful, with only 5% reporting a neutral stance.

4.4 Theories of change supporting the findings

Overall, this study's quantitative and qualitative findings are aligned and suggest that the pre-bariatric brief CBT-informed intervention reached its aims by reducing participants' MEPs and improving their Wellbeing. Several theories of change may help explain the quantitative and qualitative findings of the present research project, such as the COM-B model (Capability, Opportunity, Motivation-Behaviour; Mitchie et al., 2014), the transtheoretical change model (Prochaska et al., 2015) and/or the Health Belief Model (Rosenstock, 1974). The COM-B model proposes that behaviour change happens at the interaction between an individual's Capability to change (knowledge, skills, abilities etc.), their Motivation to perform/avoid behaviour change and an environment that offers them the Opportunity to practice this Behaviour change. This model sits at the basis of the Behaviour Change Wheel discussed in the Introduction chapter (Mitchie et al., 2011). The Health Belief Model (Rosenstock, 1974) was developed to explain and predict health-related behaviours specifically regarding individuals' uptake of health services. It proposes several mechanisms of change, suggesting that an individual's belief about their health problem and their sense of self-efficacy, together with their perception of potential barriers and benefits to behaviour change, is what enables them to engage/disengage with health-promoting behaviours.

The intervention in this study included psychoeducation about dysfunctional eating and behaviour change techniques that were highlighted by participants in their qualitative accounts. The information participants received perhaps helped raise their awareness regarding the severity of their dysfunctional eating patterns and changing their belief about their health problem being impossible to overcome. By providing participants with the skills,

knowledge and tools needed to overcome their MEPs, perhaps the group intervention and facilitators instilled hope and potentially increased their sense of self-efficacy (HBM) and their motivation to change (COM-B), developing thus their capability to enact healthy behaviours. The group intervention through goal setting, homework, and weekly reviews, further offered participants the opportunity to enact the newly learnt skills, tackle perceived barriers and rehearse new behaviours as outlined by the COM-B model (2014) and the Health Belief Model (1950). By practising the new skills between sessions and sharing their experiences and difficulties with other participants and facilitators, participants' motivation may likely have increased, and so did their ability to enact the behaviour changes regarding their eating patterns.

When interpreting the findings of the current research through the Transtheoretical Model of change lens (Prochaska et al., 2015), it can be presumed that prior to their psychological assessment, participants were in the precontemplation phase where they did not intend to act in changing their eating patterns in the foreseeable future as perhaps they were not yet aware of their existent MEPs. Following the psychological assessment, participants were informed of their problematic MEPs and recommended to attend the group intervention. Upon recognising their problematic eating patterns, participants may have potentially entered the contemplation stage and began considering the pros and cons of changing their unhealthy behaviours. In the time passing between their psychological assessment and the group intervention, which was on average 18 weeks, it is possible that participants may have entered the preparation phase.

Knowing that they were waiting to receive support, participants may have started to make small steps towards preparing themselves for changing their behaviours. This may help explain the trend observed in the reduction of scores across MEPs and Wellbeing variables from assessment to pre-intervention timepoint. Most of the significant improvements, apart from CR levels, were reported at post-intervention and may be explained by the fact that participants were presented with new skills and knowledge which may have helped them in entering the action stage where they began modifying their problematic eating behaviours and changing their habits to healthier ones. This was reflected across the accounts participants gave in their feedback questionnaires and interviews, where they reported positive changes in mindset and eating habits due to the group intervention. An overwhelming majority of participants (98%) reported that they would recommend the group intervention to others. In the below paragraphs, the limitations of the current research study and clinical implications of its findings are outlined together with suggestions for future research.

4.5. Research Limitations

This study aimed at evaluating a brief, online CBT-informed intervention for MEPs in a pre-bariatric population. It has provided promising and insightful findings that suggested the brief group intervention effectively improved participants' MEPs and Wellbeing. However, some limitations to the current research methodology need to be considered when interpreting the results, particularly in generalising these findings to the broader bariatric population. These limitations and areas of future research will be outlined in the below paragraphs.

4.5.1 Online survey

An online survey was used for participants to complete the measures across the three timepoints for this study. Whilst this ensured a strong sense of confidentiality and anonymity, it also meant that participants completed their measures in an uncontrolled setting. Due to the global pandemic, there was no option for participants to complete the study face-to-face in a controlled setting. The online questionnaires offered the flexibility to adapt to these challenging times. Nonetheless, it is possible that participants may have used the internet to check for answers whilst completing the questionnaires, which may have introduced bias in their scores. Participants may have done this out of curiosity or desire to present well and proceed with bariatric surgery. It is, however, also possible that the flexibility and privacy offered by online surveys may have reduced demand characteristics and led to participants reporting a more accurate reflection of their eating patterns and mood. In this study, the psychological assessment was used to help confirm the scores participants reported at the start of the research. However, no such assessment was conducted at the end of the intervention. Further studies are needed that could provide more control over the online survey, either by setting time limits for completion or disabling the use of the internet on the device during its completion or by adding another psychological assessment following the intervention to ascertain the accuracy of the scores reported.

4.5.2 Demand characteristics

It is possible that demand characteristics may have impacted participants' results. Participants were made aware that apart from the current study, the scores from their questionnaires were also going to be used by clinicians for the purpose of report writing to the bariatric team, which may have affected the way they responded to the questionnaires. Some participants may have believed that portraying more severe eating patterns may speed up the process of receiving bariatric surgery, whilst others may have thought the opposite was true, which may have led them to report less severe MEPs and Wellbeing on questionnaires in order to ensure their progression to bariatric surgery. However, as mentioned in the above paragraphs, participants

were included in this study based on their psychological assessment in conjunction with the scores on their questionnaires. This helped to identify potential discrepancies at baseline.

Furthermore, a qualitative strand was included to capture the subjective experiences of participants of the group intervention. This offered an additional method of assessing discrepancies between participants' reported scores on quantitative measures and their accounts at post-intervention. Participants that consented to the interview were informed that their participation will remain anonymous and confidential and that their feedback/suggestions for improvements will be anonymously disseminated to the services involved in their care, hence having no impact on their progression on the pathway. This was done explicitly to ensure that participants in the qualitative strand felt able to share their feedback without fear that this would affect their care on the pathway. Whilst, all interviewed participants shared suggestions for improvements and difficulties they faced in the group, there were no discrepancies found to highlight demand characteristics.

Furthermore, the reported improvements in participants' MEPs on the outcome measures, whilst significant, were only moderate compared to those reported in preoperative bariatric studies that did not use outcome measures to make recommendations regarding potential progression to surgery. The lack of extreme improvements observed in participants' MEPs on outcome measures indicates that if participants felt they needed to minimise the severity of their MEPs at post-intervention only to ensure progression on the pathway, this would have been only minimally present, if at all. In addition, given that the reduction in MEPs was confirmed by participants' reports in both feedback questionnaires and interviews and that they were more modest compared with prior findings in the literature, it may be assumed that demand characteristics did not compromise the results of this study. Nonetheless, future research evaluating pre-bariatric psychological interventions should consider including measures for research purposes only, as these may provide more clarity over the findings of this study.

4.5.3 Lack of randomisation and control group

The lack of a control group and randomisation are two of the most significant limitations of the present study and hence must be considered when interpreting the findings and generalising results. Randomisation has the advantage of increasing the internal validity of a study by reducing the potential presence of confounding variables that may explain the results and thus establish a more direct link between cause and effect. Nonetheless, randomisation may introduce artificiality and reduce a study's ecological validity. In the current study, the researcher did not opt for randomisation as there was a gap in the evidence-based of pre-

bariatric psychological interventions in the UK population to justify introducing further delays in the already long timelines of candidates to surgery. Therefore, it was considered important to gain some preliminary findings regarding the effectiveness of the intervention investigated in this study prior to introducing randomisation and a control group.

Furthermore, a qualitative strand was also introduced to assess whether the findings observed in this study were caused by confounding variables or whether they were due to the group intervention. In addition, to compensate for the lack of a control group, the researcher introduced a third timepoint into the analysis: psychological assessment. This offered the opportunity to assess whether the observed results were due to the passing of time alone rather than the intervention. Therefore, whilst this was only a quasi-experimental study, several mechanisms were implemented to control for bias which partially compensates for the lack of randomisation and a control group, affording validity to these findings within certain limitations. Nonetheless, there is a need for further research in this area that employs randomisation and a control group to build the evidence needed in this understudied population. Such studies would allow for a more causal relationship to be drawn and for results to be generalised with more confidence across the pre-bariatric population. Furthermore, they would help inform guidelines for the clinical care of individuals on bariatric pathways in the UK and potentially support the recent recommendations for psychological provision endorsed by BOMSS (Ogden et al., 2019).

4.5.4 Lack of follow-up

This study was conducted as part of a Doctorate in Counselling Psychology, and as such, it had time and resource limitations. In addition, the global pandemic introduced unexpected changes to the original design of this study. With the NHS having to adapt their delivery of services and IRAS procedures being delayed, the researcher was unable to wait for the ethical approval that would have allowed for the follow-up of participants in this study, limiting the generalizability and interpretation of its findings. This study's lack of follow-up makes it impossible to clarify whether the significant improvements in MEPs and Wellbeing participants reported post-intervention would be maintained at surgery timepoint. Arguably, due to the criteria candidates need to fulfil to proceed to bariatric surgery in the UK, it may be more suitable for future studies in this population to investigate if these improvements are maintained prior to the surgery date, rather than only at post-surgery timepoint. This will help establish if such brief interventions help prepare individuals for surgery. Therefore, researchers may want to consider introducing a follow-up timepoint closer to surgery in their studies, but before individuals are requested to adhere to a liquid diet in preparation for surgery.

4.6 Research Strengths

Despite its above-mentioned limitations, the current research has multiple strengths and brings significant contributions at the intersectionality of bariatric psychology, obesity, and disordered eating, which will be presented below. This study has addressed some of the previous shortcomings highlighted in the current literature by removing weight as a primary outcome and focusing on capturing improvements on MEPs and Wellbeing, which are current exclusion criteria for bariatric surgery candidates in the UK (NICE, 2014). Furthermore, this study employed stricter inclusion criteria, including only participants that presented with MEPs at their psychological assessment and not relying solely on questionnaires to assess this. As such, it ensured the attendance of only those candidates to surgery that would be most likely to benefit from the targeted intervention investigated in this study and that would have otherwise been discontinued from the bariatric pathway.

Furthermore, as far as the author is aware, this is to date the first study looking at evaluating a brief pre-bariatric group intervention on the UK population. In addition, the generalizability of previous findings was hindered due to the discrepancies between the lack of diversity reported in previous studies (Gade et al., 2014; Kalarchian et al., 2013; Wild et al., 2011; Lier et al., 2012) and the diverse UK pre-bariatric population (Alkharaiji et al., 2018). As such, this study also helped to bridge the gap in the literature by recruiting participants from a diverse catchment area that are more representative of the wider UK bariatric population. In addition, to the author's knowledge, this is the only mixed-methods design study in pre-bariatric psychological interventions literature. By including a qualitative strand, the researcher was able to capture the primary mechanisms of actions of the group intervention and participants' suggestions for improvements. The research further included the first timepoint, psychological assessment, due to the lack of a control group to assess whether time alone could be responsible for any changes found in the data across timepoints. These are important aspects to consider before rolling out a multisite RCT, which is considered the gold standard for producing evidence by NICE guidelines.

4.7 Clinical and research implications

The findings of this study highlighted that a brief online CBT-informed group psychological intervention for MEPs in a preoperative bariatric sample in the UK effectively improves dysfunctional eating and Wellbeing. These preliminary findings suggest that brief group interventions may be effective in preparing candidates with mild to moderate MEPs on bariatric pathways to meet criteria and qualify for surgery. Furthermore, due to its brevity, group format, and online delivery, the current intervention investigated in this study is cost-effective whilst also producing optimal results. This suggests that it would be feasible for such brief group

psychological interventions addressing MEPs to be included as part of routine care on bariatric pathways as they require minimal resources. Introducing such interventions across bariatric pathways in the UK would have a significant benefit for candidates to bariatric surgery presenting with mild and moderate MEPs, preventing them from being discontinued on the pathway and referred to external psychological services with long waiting lists, and allowing them to continue to bariatric surgery whilst receiving the support they need in a timelier manner. Hence, for these candidates, such interventions would significantly reduce their waiting timings and potentially improve dropout rates.

These findings and clinical implications come in support of the recent stepped-care recommendations for psychological provision on UK bariatric pathways that were endorsed by BOMSS (Ogden et al., 2019). While this research was only quasi-experimental and thus lacked a control group or randomisation, limiting its findings' generalizability, it benefited from ecological validity as it was conducted as part of the regular care offered to individuals on a bariatric pathway. Nonetheless, future studies would be needed to replicate the findings and investigate whether the benefits of such an intervention are maintained up to surgery timepoint. In respect to Wellbeing, the results of this study support the claim that improving the MEPs of individuals secondarily improves their mood, anxiety and/or quality of life (Fairburn et al., 2013). Therefore, such brief group interventions may offer a secondary benefit to candidates on bariatric pathways and further contribute to improving their motivation to continue to adhere to the multiple lifestyle changes required on bariatric pathways (Caniato & Skorjanec, 2002).

The current study's mixed-methods design helped shed light on the mechanisms of actions of the brief intervention and how this can be improved, thus bringing clinical contributions for practitioners seeking to develop psychological interventions for this population. Participants' accounts and the small dropout rates (3 participants deferred for another group intervention after starting) confirmed that the brief CBT-informed group intervention was both acceptable and feasible. Furthermore, participants found the online delivery in the context of the pandemic to be optimal, and whilst some stated a preference for a face-to-face intervention, they highlighted that even after the pandemic, services should consider offering the online option to candidates as this may ensure a better attendance of the program. Hence, bariatric services should perhaps consider hybrid models of delivery of psychological interventions on the pathway or give the option of attending online or face-to-face interventions to their patients.

Furthermore, participants highlighted that the primary mechanisms of action for the CBT-informed intervention were psychoeducation, regular eating, self-monitoring, planning, distraction techniques, mindfulness, and self-compassion. From their feedback, it transpired

that regular eating, planning, and self-monitoring were predominantly helpful in tackling the physiological triggers of dysfunctional eating, whilst the distraction techniques, mindfulness and self-compassion were predominantly helpful in addressing the emotional aspects of dysfunctional eating and improving Wellbeing. Therefore, alongside the evidence-based mechanisms for disordered eating, practitioners may want to consider integrating third wave CBT tools when designing interventions for pre-bariatric candidates, given the complexity of this client group. Notably, the findings of this research suggest that Mindfulness and Self-Compassion may help in tackling the shame and self-criticism around dysfunctional eating and weight that is often associated with weight stigma in individuals living in larger bodies. Given the prevalence of weight stigma in our society and its detrimental impact on eating patterns (Friedman & Puhl, 2012), it is important that clinicians consider these aspects in designing interventions for individuals living in larger bodies.

Additionally, the qualitative findings of this research study highlighted that group processes were as critical in helping participants change their dysfunctional eating behaviours as the mechanisms of action specific to the CBT model (Fairburn et al., 2013). This supports wider literature that indicates the effectiveness of integrative approaches (Zarbo et al., 2021). In addition, an overwhelming majority of participants wanted more time to interact with each other in the group intervention. An implication of this finding might be the need to consider integrating a more interpersonal, relational approach when designing CBT group interventions, rather than primarily focusing on skills learning and psychoeducation. Providing with corrective relational experiences may be a powerful group mechanism that could potentially lead to further improvements in participants' MEPs and Wellbeing.

A further implication of the qualitative strand findings is regarding the length of the intervention. Most participants reported wanting the intervention to be longer and expressed a particular interest in learning more about body image difficulties and self-compassion. Therefore, future studies may want to investigate whether extending the intervention and including more information on body image and self-compassion may bring additional improvements to participants MEPs and Wellbeing. Given the current socio-economic context, following a global pandemic and the potential financial recession, clinicians need to balance between participants' outcomes, their levels of satisfaction and the cost-effectiveness of interventions.

Reflective of the diverse population of this study, participants suggested that the content of the group needs to be culturally updated, particularly surrounding body image issues and the examples of food used in the group. Clinicians may, therefore, want to adapt the content of their interventions to the client group they serve by incorporating diverse examples of food and different cultural models of beauty. Furthermore, some participants suggested that the

group should include more information on bariatric surgery. Whilst this suggestion may be due to the fact that the bariatric service suspended its psychoeducational bariatric group during the pandemic, applied psychologists may want to consider designing inter-disciplinary group interventions that would be co-facilitated with staff from other disciplines and thus include more information on surgery.

A relevant clinical implication in designing and facilitating interventions comes from participants accounts that reflected a preference for a more flexible approach to the group protocol, with facilitators focusing less on providing information and more on facilitating interaction. This suggests that applied psychologists should tailor the group content to its members each cycle, rather than providing a protocol-driven intervention covering information that may not be relevant to the group members. These findings contrast the NICE guidelines' recommendations for the development of protocol-based interventions and support the current criticism of their hierarchy of evidence (Guy et al., 2012; Pilgrim et al., 2009). Thus, practitioners designing interventions for this client population should ensure these can be tailored to accommodate and celebrate for differences between individuals/groups of individuals and not rigidly apply a mechanistic delivery of a group protocol.

Lastly, due to the difficulties with English language comprehension skills, one of the interviews was omitted from the analysis. The participant's language skills were found to be sufficient in an individual context at the assessment timepoint; however, during the research interview, it was revealed that within a group setting, they found it challenging to comprehend the dialogue between participants and facilitators as well as the content and aim of the group intervention. They reported having struggled with understanding the different accents of group participants. Furthermore, they mentioned other contributing factors to their difficulties in engaging and understanding the group intervention, such as the occasional audio delays caused by internet connections, technical issues such as background noise and unmuted microphones creating an echo, and other participants speaking over each other. While the participant's contribution was not used to respond to the research questions of the current study, it generated meaningful recommendations for service development. Below are some of the recommendations that were made and implemented by the psychological service as a result of the participant's contribution to the research study:

- At the psychological assessment timepoint, it was recommended that clinicians encourage all participants with English as a second language to engage and read the materials for the group intervention prior to attending the sessions to familiarise themselves with the language, content and/or identify words/paragraphs they struggled to understand and ask clarifications from facilitators.

- Clinicians were encouraged to identify at psychological assessment timepoint all participants with English as a second language that may struggle with language comprehension in group settings and recommend in their reports for facilitators to check in with these participants during and following each group session. This was done to ensure that participants understood the session's content, had a space to ask clarifying questions and understood the homework activity set out by facilitators for the following session; hence, ensuring that they could benefit from the intervention.
- A further recommendation was made for facilitators to encourage participants with English as a second language that may struggle with comprehension, to ask clarifying questions during the group (in the chat or by unmuting themselves) or email facilitators should they have any questions about the group intervention.
- In terms of online facilitation, a recommendation was made for facilitators to enforce group rules and mute individuals that are not speaking to avoid background noise and/or echoes that would make it more challenging to focus for participants with English language comprehension difficulties.
- At the assessment timepoint, clinicians were encouraged to check in with participants on whether they had a stable internet connection. This was considered necessary in minimising distractions caused by potential audio delays, disconnections that may cause difficulties for participants in following and understanding the group content.
- Clinicians were recommended to pause the participation of individuals identified as struggling to comprehend the content of the group intervention due to language barriers. Furthermore, it was recommended that facilitators inform the bariatric service and request an interpreter be provided for the participant in the future.

These recommendations bear significant relevancy to clinical practice, practitioners and services considering implementing group interventions via online settings. They are also noteworthy for researchers considering developing and implementing such interventions. In addition to the above recommendations, future researchers should also consider:

- Defining how inclusion and exclusion criteria for a study are to be assessed, more specifically, how clinicians can determine the language comprehension skills of participants at recruitment timepoint.
- Contingency planning: from an ethical perspective ensuring that all research participants that are unable to finish the psychological intervention due to language barriers are offered an interpreter service instead.
- Encouraging all participants with English language comprehension difficulties to read the materials prior to attending the intervention.

- Sending all materials regarding the intervention in advance of each session with sufficient time for participants to read and engage with these.
- Whether participants have a stable internet connection, for online interventions, at recruitment timepoint.
- Enforcing group rules in online interventions to minimise distractions whilst maximising engagement and participant focus during the intervention.
- Including mechanisms of assessing the comprehension of the group content by participants when evaluating interventions (e.g., introducing qualitative feedback, semi-structured interviews, Likert scale questionnaires etc.)

These recommendations and research implications came out from the omitted research interview and highlighted the importance and relevancy of qualitative strands in evaluating and improving psychological interventions. Whilst the interview content was unable to be analysed, the qualitative data helped highlight essential aspects for clinical and research practice, particularly when working/recruiting from a diverse catchment area in which the likelihood of participants having English as a second language is higher. Therefore, these recommendations and clinical implications may be a relevant starting point to ensure that services and researchers can provide equitable services to a diverse client group.

To summarise, several clinical implications can be drawn from the findings of the current study. These span from the optimal length of preoperative psychological interventions, the mechanisms of actions and group processes these interventions should include to content, facilitation, and delivery considerations for designing and delivering clinical interventions in pre-bariatric populations.

4.8 Future studies

The literature review of preoperative psychological interventions, together with the results and limitations of the present study, highlight some potential recommendations for future research. Firstly, more studies are needed to evaluate preoperative psychological interventions for MEPs in the UK and internationally. Studies with larger sample sizes, greater sample diversity, control groups and follow-up are needed to clarify the mixed findings that the literature has thus far rendered. These could help build the evidence-based for this client population and inform the clinical guidelines of care. There is also a need for future studies to follow-up participants attending preoperative interventions, not only at post-surgery timepoints but rather just before surgery, to assess whether the benefits of such interventions are maintained over time. This would help clarify whether such interventions effectively prepare individuals on bariatric pathways presenting with MEPs for surgery and highlight whether top-up sessions

might be needed, either pre- or post-operatively, to help maintain the benefits of such interventions long-term. Furthermore, there is a need for more research on preoperative psychological interventions for MEPs offered online. This could help services integrate online interventions into their routine care. These interventions could help bariatric services with large catchment areas offer equitable care to individuals, enabling participants in remote rural areas or those who are differently-abled to receive the support they need.

Researchers should also consider introducing both pre- and post-intervention psychological assessments. This would allow for inclusion only of those participants suited to the intervention offered, removing recruitment bias. Furthermore, the two assessments would allow researchers to check whether the proportion of improvement observed in participants scores matches with that reported by clinicians following their assessment. This process would enable a more rigorous assessment of participants' ability to use the tools and information provided by such interventions in changing their eating patterns and a more thorough evaluation of the success/failure of preoperative psychological interventions.

This study was underpinned by the CBT model and its third wave approaches. As previously highlighted, most research in pre-bariatric psychological interventions employed primarily BT or CBT interventions except for three studies that employed other models (Wild et al., 2011; Caniato & Skorjanec, 2002; Delparte et al., 2019). This implies a need for future studies to compare the effectiveness of different treatment models in this client population, which could help identify common mechanisms of actions that are successful in engendering behaviour change. Furthermore, these could highlight whether certain types of individuals may benefit from certain types of interventions whilst on bariatric pathways. Whilst CBT interventions are often promoted due to being time-limited interventions that fit with the DoH socio-economic agenda, based on the qualitative accounts of participants; future research should consider tailoring interventions to this client population by integrating approaches and tools from different therapeutic modalities.

Furthermore, the gaps identified in the literature suggest a need for qualitative or mixed-methods studies in preoperative psychological intervention literature as this was the first study that captured the subjective experience of participants in attending such an intervention. Qualitative/mixed-methods studies could help inform the development of preoperative psychological interventions and clarify the mechanisms of actions specific to the intervention that participants found relevant. This could then inform the further development of such interventions. Future qualitative/mixed-methods studies could also shed light on whether the importance that participants gave to relational aspects of the intervention in this study was on account of the challenges of the COVID-19 pandemic or whether preoperative psychological

interventions should consider integrating more relational aspects in their protocols to improve their effectiveness. In this section, the main suggestions for future research as relevant to this study were captured to help inform the development of the evidence base for pre-bariatric surgery clients.

4.9 Final Reflections

My journey through this research project helped me develop both professionally and personally. Most importantly, science has helped me become a better human, not a perfect one, but a better version of myself. This project allowed me to engage with a contentious topic in unprecedented times, a world pandemic. Engaging in the literature review around *'obesity'*, I fell into the mainstream weight normative approach to health. However, the humanistic part of my Counselling Psychologist identity wondered where the people that these numbers represent are? What is their view? Why has it not been captured? This led me to follow on social media people like Sonia Renee-Taylor, Aubrey Gordon, Dr Charlotte Cooper, and many others. I am deeply grateful to their teachings, books, articles, blogs, for they have educated me about my weight biases and helped me work towards a weight inclusive approach to health. I aimed through this study to bring a critical perspective on the narratives of obesity with the hope that this will help highlight the historical oppression against larger bodies and inform clinicians about how inadvertently we may be contributing to this through the language and research we produce.

The choice of mixed-methods design was informed by my belief that behind every number sits a person with the right to contribute to the treatment they are being offered. I remain reflective of the power imbalance present in the study that may have inadvertently impaired participants from speaking uninhibitedly about their experiences. In addition to attempting to mitigate this risk, I also emphasised in my results and discussion chapters participants' difficulties with the group and their suggestions of improvement. Therefore, I want to encourage practitioners to engage in mixed methods studies when evaluating interventions. Between the Black Lives Matter movement, Extinction Rebellion protests, the Me-Too movement, and the movement of women against femicide, it has never been more relevant and evident that we need to listen to one another, learn from each other and work together to create a better world. The mixed-method approach gives researchers the opportunity of improving interventions by combining both clinical expertise and lived experiences, honouring both streams and allowing them to complement each other naturally.

It was my hope that the group would be helpful to individuals living in larger bodies that struggled with MEPs, and I was so pleased that both the numbers and the individual accounts

were pointing in this direction. I used the opportunity to present the findings to the bariatric multidisciplinary team and the private psychological service to inform the development of the group intervention and advocate for increasing the length of the intervention to six sessions.. In collaboration with the clinicians from the private psychological service, I was able to update the content of the intervention based on the feedback received from participants. The journey of undertaking this research project has been rewarding, and I have been humbled by the skills and knowledge that I have learned along the way. I would like to encourage researchers to be aware of the power of language in shaping belief systems that oppress larger bodies. By challenging our own weight biases, we can produce better research that serves rather than harms individuals living in larger bodies.

4.10 Conclusions

This research has provided greater insight into the effectiveness of a brief CBT-informed group intervention targeting mild to moderate MEPs in a pre-bariatric UK sample population. Furthermore, it highlighted the need and benefits of an increased psychological provision on UK bariatric pathways, which could help shift the perceived role of applied psychologists from assisting services to screening out candidates that do not meet criteria to preparing these individuals to meet criteria and access surgery. To date, this is the first study to explore the impact of a group intervention offered preoperatively to candidates on an NHS bariatric pathway. Furthermore, this is the first identified mixed-method study in the pre-bariatric psychological intervention literature. Whilst it employed a quasi-experimental design limiting the generalizability of its findings; this study showed significant improvements in participants' MEPs and Wellbeing following their attendance of the group intervention. It also offered insight into its mechanisms of action and areas of improvement. Further research studies are needed in preoperative psychological interventions that employ different therapeutic models, randomisation, and follow-up participants closer to surgery date to help establish whether improvements are maintained over time. This study contributed to building the evidence base for this under-researched client population and provided preliminary support to the recent guidelines for a stepped care model of psychological provision on bariatric pathways (Ogden et al., 2019).

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