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Are Third Wave Approaches Effective for Weight Self-Stigma And Body Image In Individuals With Overweight/Obesity?

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by

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Abstract

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Research into third wave and/or mindfulness interventions (TWM) has developed greatly over the last two decades, with much research illustrating the benefits of these approaches on a multitude of psychological and physical health problems. Chapter one of this thesis is a systematic review investigating the effectiveness of TWM on weight self-stigma, body image, and body weight in individuals with overweight/obesity. A systematic search of electronic databases was carried out and a total of 12 experimental studies met the inclusion criteria. Data from these papers were compiled and synthesised into a narrative review. The overall pattern of results suggested that TWM interventions may reduce weight self-stigma and improve body image. Results were less clear for body weight. Results should be interpreted with caution due to limitations such as non-generalisability and risk of bias in the included studies. The discussion suggests the need for more rigorously designed trials with diverse populations.

Chapter two investigates the relationships between weight stigma, body image and excess weight loss (EWL) and the moderating effect of the TWM self-compassion. Participants in this cross-sectional study had undergone bariatric surgery at one of three National Health Services (NHS) within the last 5 years (n = 87). They were predominantly female (88.5%), White British (90.8%) and aged over 45 (55%). Participants completed a battery of self-report questionnaires via online survey. Results showed self-compassion was associated with better body image. The relationship between internal stigma and body image was moderated by self-compassion, such that for participants with high self-compassion, their appearance evaluation was dependent on their level of internal stigma, whereas participants with lower levels of self-compassion evaluated their appearance poorly irrespective of stigma. Stigma and body image were not associated with EWL. This thesis suggests that TWM, particularly those increasing self-compassion, in bariatric surgery candidates could be a helpful intervention to improve outcomes from surgery.

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Research Thesis: Declaration of Authorship

Print name: STEPHANIE ENNIS

Title of thesis: Are Third Wave Approaches Effective for Weight Self-Stigma, and Body Image in Individuals with Overweight/Obesity?

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signature: .....Date: 25.8.23

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Definitions

AE ..... The Appearance Evaluation subscale measures feelings of physical attractiveness or unattractiveness ; satisfaction or dissatisfaction with one's looks. High scorers feel mostly positive and satisfied with their appearance; low scorers have a general unhappiness with their physical appearance.

AO ..... The Appearance Orientation subscale measures the extent of investment in one's appearance. High scorers place more importance on how they look, pay attention to their appearance, and engage in extensive grooming behaviours. Low scorers are apathetic about their appearance; their looks are not especially important, and they do not expend much effort to "look good".

BASS..... The Body Areas Satisfaction subscale is Similar to the Appearance Evaluation subscale, except that the BASS taps into satisfaction with discrete aspects of one's appearance. High composite scorers are generally content with most areas of their body. Low scorers are unhappy with the size or appearance of several areas.

BID……..Body image dissatisfaction is a subjective unhappiness with aspects of one's own body.

Excess Weight Loss (EWL) This the percentage of an individual's excess weight lost after bariatric surgery. An individual's excess weight is calculated by subtracting their ideal weight as worked out by BMI, from their pre-operative weight to find the amount of weight they carry over their ideal weight.

Measures ..... Measures are psychological tests (also known as mental measurements, psychological instruments, psychometric tests, inventories, rating scales). They are standardised measures of a particular psychological variable such as personality, intelligence, or emotional functioning.

NHS..... The National Health Service is the publicly funded healthcare system in England.

TWM……. Third wave and mindfulness interventions are third wave CBT therapeutic approaches that focus on mindfulness, acceptance of inner states such as thoughts and emotions, personal values, metacognition, and relationships. Examples include compassion focused therapy, acceptance and commitment therapy, dialectical behaviour therapy, mindfulness-based cognitive therapy.

Chapter 1 The Effectiveness of Third-Wave Interventions on Body Image and Weight Self-Stigma in Overweight Individuals: A Systematic Review

1.1 Abstract

Self-stigma has been shown to have many negative consequences on individuals living with overweight/obesity. Furthermore, body-image dissatisfaction is a common experience for such individuals and both self-stigma and poor body image have been associated with poor mental health and reduced quality of life. Individuals often struggle to achieve their long-term health and weight loss goals as most weight loss interventions are solely focused on dietary and lifestyle changes rather than psychological factors. The aim of this systematic review was to establish the effectiveness of third-wave or mindfulness (TWM) interventions on self-stigma and body image in adults with overweight/obesity. A further aim was to find out whether these interventions also had an impact on the body weight of participants. The review was carried out using PRISMA guidelines for systematic reviews. A search was completed using four electronic databases using search terms adapted from previous reviews on body image, third-wave interventions, and self-stigma. The search identified twelve studies which met inclusion criteria. Results indicated TWM interventions can be helpful for self-stigma and body image dissatisfaction (BID in adults with overweight/obesity. The results for body weight were less clear. These conclusions should however be taken with caution due to the limited number of studies available for inclusion and the various limitations of their design and included population. More research is needed in this area using more rigorous designs to fully determine the impact of TWM interventions on self-stigma, (BID) and body weight.

Keywords: Systematic review, self-stigma, body image, obesity, third-wave CBT, ACT

1.2 Introduction

Overweight and obesity is a major public health concern (Rosengren, 2021). In statistics from 2016, it was estimated that there were 1.9 billion adults classed as overweight, of which at least 400 million were classed as obese (WHO, 2018). One is classed as overweight if they have a body mass index (BMI) of 25 or more and obese if it is 30 or more (Frankenfield, 2001). The cause of obesity is complex and is likely a combination of genetics and environmental factors (Pellegrini, 2021). Obesity is characterised by an excess of body fat, which is associated with an augmented risk of physical health problems and higher rates of mortality (Calle et al., 2009). Furthermore, biopsychosocial problems and psychiatric disorders such as anxiety and depression are also commonplace, all of which have been found to have a negative effect on the quality of life (QOL) of individuals with overweight/obesity[1] (Darebo et al., 2019). The financial burden of obesity on healthcare systems is vast (Finkelstein, 2009) and thus research into interventions that may help those struggling with their weight is imperative. Evidence shows that even small amounts of weight loss can significantly reduce the health risks linked to obesity (Wing et al., 2011). Unfortunately, interventions for weight management commonly focus solely on dietary and exercise changes and this rarely produces long-term positive results (Elfhag & Rossner, 2005), with most individuals reaching their maximum weight loss at about six months, but gradually regaining weight over time (Loveman et al., 2011).

[1] The use of the term individuals with overweight/obesity is accepted and used in the literature and is a way of ensuring person first language. Rather than labelling the person as an obese person, this language aims to reduce weight-bias and helps to portray the individual as a person living with the condition of being overweight or obese (Obesity Action Coalition, 2021)

A concept that has been linked to obesity due to its impact on psychological well-being is that of body image, which can be defined as "the multifaceted psychological experience of embodiment" (Cash et al., 2004). Body image is a multidimensional construct and has been described as being comprised of two aspects: evaluative (the level of satisfaction with one's appearance) and investment (the psychological importance one places on appearance). Within these are the domains of cognitive distortions, subjective (dis)satisfaction, behavioural avoidance, affective reactions, and perceptual inaccuracy (Cash & Pruzinsky, 2002). Body image dissatisfaction (BID), a subjective unhappiness with aspects of one's body (Thompson et al., 1999), has been described as being due to an apparent incongruence between actual body image (i.e., cognitions, perceptions, and emotions concerning physical appearance (Cash, 1990) and the idealistic body image (i.e., internalised ideals about one's physical appearance).

BID is becoming increasingly prevalent globally (Barker & Galambos, 2003; Ferreiro et al., 2014), is a notorious source of concern for those with overweight/obesity and has often been noted to be a primary motivator for seeking help to lose weight (Rosenberger et al., 2006). It has been argued that distress from BID in individuals with obesity may impact emotion regulation and thus lead to increased eating as a coping mechanism. This can then leave individuals stuck in a vicious cycle, unable to lose and/or maintain weight loss (Schwartz & Brownell, 2004). Thus, interventions which also aim to improve body-image satisfaction in individuals with obesity are likely to be beneficial by not only reducing an individual's appearance-related distress but also by aiding them to reach their long-term health and weight loss goals.

Another important yet dismaying factor that is known to impact overweight and obesity is weight stigma. This can be described as discrimination, stereotyping, and/or social exclusion of an individual because of their body weight (Brewis et al., 2018). Unfortunately, the stigmatisation of overweight individuals is rife, and it is said that they are nine times more likely than healthy weight individuals to experience discrimination based on their weight. Unsurprisingly this can be devastating for those who experience it (Prunty et al., 2020) and has been linked to increased levels of psychological distress (Alimoradi et al., 2020).

Possible reasons for the high prevalence of weight stigma could be that body weight is outwardly easily perceivable to others. Furthermore, society continues to be what has fairly recently become known as "fat phobic" with thinness idolised and presented as the most valued body type (Stoll et al., 2022). Negative stereotypes and prejudices against those who struggle with their weight are pervasive within modern society (Lillis et al., 2011). For example, it is often perceived that people are to blame for their weight and that they are somehow incompetent for not being able to manage it (Stoll et al., 2022). Overt bias and discrimination due to weight is one of the few forms of stigma which is still seen as acceptable in today's society (Puhl et al., 2010). Thus, individuals regularly face discrimination in multiple areas of their life such as employment, relationships, and healthcare (Puhl & King, 2013).

Unsurprisingly, weight stigma has been associated with numerous psychological difficulties such as mood and body image disorders and poor health behaviours (Puhl & Heuer, 2009; Carr & Friedman, 2005). Research has shown that overweight individuals who perceive weight stigma from others, often become very self-stigmatizing (through internalising this perceived social stigma) and may start to devalue themselves due to their

weight, believing that are to blame for their weight problems (Durso & Latner, 2008). This is referred to as weight self-stigma (Lillis et al., 2010) or internalised weight bias (IWB; Durso & Latner, 2008). Reviews have illustrated that this internalisation of stigma further exacerbates the already debilitating effects of social stigma, and they linked weight self-stigma to a decline in various psychological factors such as self-esteem, hope, and empowerment (Livingston & Boyd, 2010).

Studies have elucidated that higher baseline weight self-stigma is associated with poorer weight loss outcomes and greater attrition from weight management programs (Carels et al., 2009). Other research has found that self-stigma was closely related to inferior QOL in relation to health (Lillis et al., 2011). This suggests that self-stigma is another area of importance in relation to long-term weight management, adherence to weight loss plans, and overall QOL.

Previous reviews have suggested the usefulness of third wave and/or mindfulness interventions (TWM) in addressing self-stigma (Stynes et al., 2022; Griffiths et al., 2018; Westerman et al., 2020) and BID (Rahimi-Ardabili., 2018; Linardon et al., 2018). TWM interventions have gained in popularity over recent years in the treatment of a variety of psychological and somatic disorders (Linardon et al., 2018). There is some debate over what constitutes a TWM intervention but the most commonly accepted are Compassion Focused Therapy (CFT), Acceptance and Commitment Therapy (ACT), Dialectical Behaviour Therapy (DBT), Functional Analytic Therapy (FAP), Schema Therapy (ST), Metacognitive Therapy (MT), Mindfulness-based Cognitive Therapy or Mindfulness-Based Stress Reduction (MBI's; Hayes et al., 2011). These interventions stem from and preserve elements of Cognitive Behavioural Therapy (CBT) which is classed as a second-

wave intervention. However, their approaches differ (Hofmann et al., 2010) and instead of targeting the frequency, intensity, or context of thoughts, these interventions aim to target the awareness of cognitive and emotional processes. They aim to do so by encouraging techniques that inspire acceptance of internal states, mindfulness (being in the present moment), metacognition, and awareness of values. TWM interventions aim to help people to increase their psychological flexibility and reduce their avoidance and attempts to suppress their difficult internal experiences. Unlike CBT which might aim to challenge maladaptive self-stigmatising thoughts, third wave approaches would aim to allow the candidate to alter the way they react / relate to their self-stigmatising thoughts rather than try to change them (Hayes, 2004). Positive correlations have been found between self-stigma and psychological inflexibility (Krafft et al., 2018). Suggesting that the more self-stigmatising one is, the more psychologically inflexible they are likely to be. Of course, these findings cannot imply causation, but they suggest that enabling people to respond more flexibly to their inner experiences might have a positive impact on self-stigma (Krafft et al., 2018), which in turn may aid individuals with obesity to reach their weight loss and health-related goals.

While previous reviews have elucidated the impact of TWM interventions on self-stigma in general populations (Stynes et al., 2022) and others have investigated interventions aimed at increasing self-compassion in individuals with overweight and obesity (Rahimi-Ardabili, 2018), there is a gap in the literature investigating the overall impact of TWM interventions on both outcomes in an overweight/obese population specifically. Poor body image and high levels of weight self-stigma are common correlates of overweight/obesity, and this has been shown, unsurprisingly, to have a very negative impact on an individual's mental health (Friedman & Brownell, 1995), their attempts to

lose weight, and their ability to achieve their health-related goals (Schwartz & Brownell, 2004). Given the stigma and prejudice in society towards people with overweight/obesity (Prunty, 2020), it seems important to try to rectify this lack of research so that there may be more evidence to show which therapeutical modalities may be most helpful to them.

Currently, while there are guidelines (Ogden et al., 2019), there is no definitive psychological therapy treatment pathway for individuals in the UK with overweight/obesity.

Thus, this systematic review aims to add to findings from previous reviews by synthesising findings from research to elucidate whether TWM interventions are successful in improving body image and reducing self-stigma, specifically in adults with overweight/obesity. Furthermore, we are interested in whether this then has a positive impact on the body weight of participants.

The objective of this review is to find all TWM intervention studies in adults with overweight/obesity where self-stigma and/or body image were used as outcome measures.

This review aimed to answer the subsequent overall question:

How effective are TWM interventions in addressing body image concerns and self-stigma in adults with overweight/obesity? And does this impact their body weight?

This overall aim will be answered by answering the questions below:

- Are TWM interventions effective for addressing body image and levels of self-stigma in adults with overweight/obesity?
- Additionally, do these interventions targeting body image and self-stigma affect the body weight of participants?

- Which TWM model is most effective and is this related to the intervention type or length of treatment?

1.3 Method

This review has been reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidance (PRISMA; Page et al., 2021). PRISMA guidelines are a 27-item checklist and diagram outlining elements that are crucial to report in systematic reviews (Page et al., 2021)). The protocol for this review was registered with PROSPERO, the international prospective register for systematic reviews (ID: CRD42022363305) on the 3rd of October 2022.

Inclusion criteria were original research papers with randomised controlled trials (RCTs), controlled trials (non-RCT) or non-controlled (pre-post) studies published in the English language using TWM-based interventions where changes in body image or self-stigma were measured in adults with overweight/obesity. Books and posters were excluded as were studies employing yoga, dietary changes, or physical exercise as part of the intervention (Stynes et al., 2022).

1.3.1 Search Strategy

The search strategy employed combinations of key search terms related to interventions of interest, outcomes of interest, and target population of interest. Searches using keywords, phrases and subject headings were carried out without specifying a start date and thus this review includes studies up to and including February 2023. Search terms for TWM approaches were kept broadly in line with a previous systematic review by Stynes et al., (2022) to encompass a wide variety of TWM approaches. For full details of

the search strategy used please see Appendix A or the following PROSPERO link: https://www.crd.york.ac.uk/PROSPEROFILES/363305_STRATEGY_20220927.pdf.

1.3.2 Types of Participants

Studies were included if the participants were adults (aged ≥18) with overweight/obesity (BMI ≥25) who took part in investigations examining the effects of TWM on body image and/or self-stigma. Additionally, all studies including participants who have undergone bariatric surgery within the last five years were also included. The rationale for this is that even with a healthy current BMI, the bariatric population often continues to struggle with the same difficulties with body image (Alegria & Larsen, 2014) and weight self-stigma (Pearl et al., 2019) despite weight loss, and therefore the post-bariatric surgery participants would also likely benefit from the same interventions as those who are still overweight. Thus, it felt important not to exclude this population as the area is already very under-researched (Johnston et al., 2023).

Studies were excluded if participants had binge eating disorder (BED) as this is classed as a standalone eating disorder for which CBT is recommended as the treatment of choice (National Institute for Health and Care Excellence [NICE], 2019). Studies were also excluded where participants were under 18 years old or were not classed as overweight or obese (BMI ≤25).

1.3.3 Types of Interventions

Following previous reviews investigating TWM interventions (Stynes et al., 2022; Dimidjian et al., 2016; Feliu-Soler et al., 2018) a wide array of interventions were included

including: Acceptance and Commitment Therapy (ACT), Compassion focused therapy (CFT) Compassionate Mind Training (CMT), Dialectical behaviour therapy (DBT), Functional Analytic Therapy (FAP), MCT, Mindfulness-Based Stress Reduction (MBSR), Mindfulness-Based Cognitive Therapy (MBCT), Mindfulness-Based Eating Awareness Training (MB-EAT), Mindfulness-Based Relapse Prevention (MBRP), Cognitive Behavioural Analysis System of Psychotherapy (CBASP) Meta-Cognitive Therapy (MCT), and Schema Therapy (ST). This was to ensure a broad search and to try to encompass all possible TWM interventions despite some controversy surrounding what constitutes a third-wave therapy. To ensure that studies with components of mindfulness were found various variations of the word "mindfulness" were searched. Furthermore, the search term 'third wave' was used to ensure studies were found that described themselves using this term. The terms self (Stynes et al., 2022) and variations of the word internal (Haley et al., 2022) were used when searching for stigma based on previous studies which have used these different terms to describe experiences of weight stigma resulting from inner experiences. The word "bias" was also included to capture internalised weight bias which is another way to describe weight self-stigma (Haley et al., 2022). Any study which featured yoga as the main or part of an intervention was excluded (Stynes et al., 2022). Furthermore, studies that had components of diet and/or physical exercise were also excluded as these factors are likely to have an impact on the outcomes of interest and thus would not be a pure indication of the effectiveness of the third wave intervention alone.

1.3.4 Type of Study Design

Research articles, theses, and dissertations reporting controlled RCTs, controlled (non-RCTs), and uncontrolled (pre-post) studies were included.

1.3.5 Sources of Information

The following electronic databases were searched on the 16th of September 2022: PsycINFO, MEDLINE, Web of Science Core Collection, CINAHL Plus with Full Text, and Google Scholar and Cochrane Database of Systematic Reviews (via EBSCO).

Relevant grey literature was also searched to ensure a wide variety of information was accessed and to reduce the risk of bias (Song et al., 2010). References of any relevant systematic reviews identified through the search were also reviewed for any relevant articles that may have been missed by the initial search strategy. Two authors of studies were contacted to check for eligibility of their research of which both replied and clarified missing information.

1.3.6 Study Selection

Records were firstly imported from electronic databases into Covidence (www.covidence.org) where duplicates were removed automatically. The remaining list was scanned manually for any missed duplicates following which two were removed. One reviewer (SE) screened all titles/abstracts using inclusion criteria and a second reviewer (MD) screened 20% with any non-congruence resolved via discussion. Using Covidence one reviewer (SE) then screened full-text articles and the second reviewer (MD) screened 20%, again with any discrepancies resolved via discussion until consensus was reached. Any articles which were not written in English were removed at this stage.

1.3.7 Data Extraction

Data from included studies following the full-text scan were extracted using the Cochrane form for data extraction (RCTs and non-RCTs (https://dplp.cochrane.org/data-

extract ion-forms). The subsequent information was taken from the included articles: publication details (e.g., author details and year of publication, country), Intervention and control specifics (design, location, duration, facilitator) participant specifics (demographics, sample size, attrition), and outcomes of interest (body image, self-stigma, body weight; including statistical significance and effect sizes where available). SE and MD piloted extraction on 20% of included studies to check for consensus. Any discrepancies were discussed until agreement was reached. One reviewer (SE) then completed data extraction from the remaining studies.

1.3.8 Quality and Risk of Bias

All studies were quality assessed by two researchers (SE & MD) using the American Dietetic Association (2012) quality criteria checklist. Based on this checklist, studies can be categorised as either positive (+), neutral (Ø) or negative (−) depending on their scores on various items relating to quality and bias.

1.3.8.1 Risk of Bias Across Studies

There is likely to be bias as the search was restricted to studies written in the English language and the majority were from peer-reviewed journals as although grey literature searching was carried out, no eligible unpublished research was found.

1.3.9 Synthesis

There was significant heterogeneity in the included research studies. Firstly, the studies used different designs so they did not all provide an effect size for the same comparison i.e., pre-post or intervention vs control, so it would not have been possible to combine these. As there is a paucity of research in the area, we did not feel able to restrict

ourselves to only one specific design such as solely RCTs or solely pre-post designs. Furthermore, the included studies used a variety of intervention models, lengths, and types, and although it was important to draw all the information together, and provide an overview of the third-wave therapeutic techniques available and their relative effectiveness, attempting to combine the varied therapies and ways of applying the therapies would contravene the Cochrane Handbook advice to not combine 'apples with oranges' as this does not provide meaningful results (Cochrane Handbook, n.d). It would not have been clinically helpful to the intended reader of this review to attempt to report an overall effect size for all third-wave approaches. Therefore, a statistical meta-analysis was not deemed appropriate or helpful, and instead a narrative approach, an informal method of reporting synthesis has been presented. Where available, data reporting change in outcomes scores pre-post and comparisons between treatment and control groups are presented. This includes significance (*p* values) and effect sizes where available. For studies where there was more than one outcome point (i.e., post and follow-up), scores pre-intervention were compared with the latest possible data point described for both control and intervention.

1.4 Results

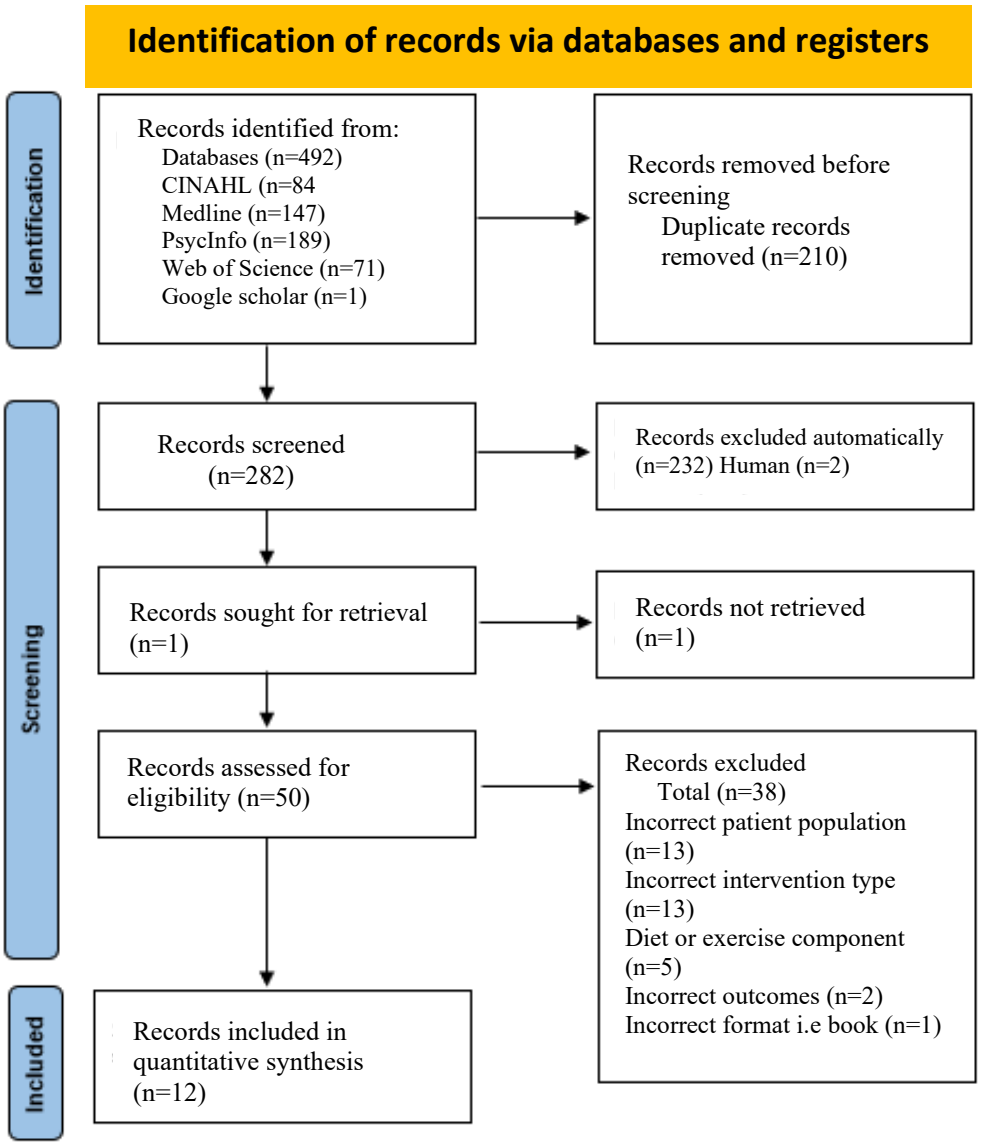
1.4.1 Study Characteristics

Twelve studies were included in this review of which eight were RCTs and four used an uncontrolled pre-post design. Eleven were published in peer-reviewed journals, and one was a dissertation. To gather these articles, searches of the electronic databases were carried out, after which 492 studies were revealed. Following the removal of duplicates, the abstracts/titles of 282 records were screened for inclusion. This resulted in

232 studies being removed due to irrelevance. Please see Figure 1 below for a diagram illustrating how studies were selected and excluded.

Figure 1

Flow Chart of Study Selection



In total, the studies included 498 participants, with sample sizes ranging between 13 and 84 (M = 41.5). Of this, participants were predominantly female (89.34 %). Participant age ranged between 34.7 and 50.8 (M = 41.90). Seven studies reported the

majority of participants to be White/Caucasian (91.48%) and five studies did not report ethnicity.

The study populations were adults with overweight/obesity. The average reported BMI fell at the low end of the obesity classification at 33.3 and ranged between 27.19 and 37.3. Populations were both clinical and non-clinical and included university staff and/or students, post-bariatric surgery patients, individuals who had undertaken a weight loss program, and individuals reporting high levels of self-stigma or body image concerns or low self-compassion.

There were a variety of different lengths of intervention in the included studies ranging from 1 day (Pearson et al., 2012) to 12 weeks (Palmeira et al., 2017;2019). Interventions took the form of either short-term group workshop interventions (Lillis et al., 2009; Pearson et al., 2012; Forbes et al., 2020), longer-term group-based sessions (Palmeira et al., 2017;2019), guided self-help plus telephone or e-mail coaching (Levin et al., 2018; Potts, 2018; Potts et al., 2022) and individual sessions only (Haley et al., 2022; Bahadori et al., 2022).

The attrition rate across studies ranged between 0 - 34.5% with an average of 14.19%. Studies took place in five different countries including the USA (Levin et al., 2018; Lillis et al., 2009; Pearson et al., 2012; Potts, 2018, 2022; Haley et al., 2022), Portugal (Palmeira et al., 2017, 2019), Sweden (Weineland et al., 2011, 2012), Australia (Forbes et al., 2020) and Iran (Bahadori et al., 2022). See Table 1 below for study characteristics.

Table 1

Characteristics of Included Studies

Author, year, and location	Therapeutic Model	Design	Duration	Intervention (I)Type	Facilitator	Sample size & Population	Attrition (%)	Age (Mean)	Gender (%F)	Ethnicity (% White)	BMI (Mean)	Control (C) group	Quality rating
Levin et al., (2018) USA	ACT	Uncontrolled pre-post	7 weeks	Guided self-help plus 5-10 mins weekly coaching	2x ACT-trained Clinical Psychology doctoral graduate students	13 individuals reporting weight self-stigma	23	35.1 SD = 12.63	90	90	34.11 SD = 5.21	None	+
Lillis et al., (2009) USA	ACT	RCT	1 day	Group workshop	Psychologist and graduate psych	84 individuals who had completed a weight-loss	3	50.75 Range = 39–64.4	T= 90.5 I= 95 C= 86	T= 91.75 I= 95 C=88.5	33.04	WL	+

					ology student skilled in ACT	program in the last 2 years. I=40 C= 44		I= 49.8 C= 51.7					
Pearson et al., (2012) USA	ACT	Pilot RCT	1 day	8-hour group workshop	2x ACT-trained psychology doctoral trainees	73 women with body dissatisfaction I=39 C= 34	4	43.4 SD = 14.7	100	Not reported	29.3 SD= 6	WL	ø
Potts, (2018) USA	ACT	RCT	8 weeks	Guided self-help e-mail vs phone	MSc level student	48 adults reporting the presence of weight self-stigma recruited from community mental health services and local	29.16	T= 36.86 I: e-mail= 38 I: Telephone= 36.31 C= 36.28	T= 88 e-mail =76.5 telephone = 87.5 C= 100	T= 93.83 I: e-mail= 88.2 I: Telephone= 100 C= 93.3	T= 36.64 I: e-mail= 36.99 I: Telephone= 36.65 C= 36.28	WL	+

						shops and businesses. I: e-mail= 14 I: Telephone = 13 C= 15							
Potts et al., (2022) USA	ACT	RCT	8 weeks	Guided self-help e-mail vs telephone	Clinical/counseling psychology doctoral students	55 adults reporting the presence of weight self-stigma recruited from community mental health services and local shops and businesses.	34.5	T= 38.66 I: e-mail= 35.8 I: Telephone= 37.4 C= 42.8	T= 82.1 e-mail =75 telephone = 82.4 C= 88.9	T= 94.8 I: e-mail =90 I: Telephone= 100 C= 94.4	T= 37.02 I: e-mail =36.62 I: Telephone= 36.68 C= 37.76	WL	+

						I: email = 20 I: telephone = 17 C = 18							
Weinel and et al., (2011;2012). Sweden	ACT	RCT	8 weeks	2 face-to-face sessions plus 6 x weekly internet sessions with weekly 30 min phone sessions.	Individual trained in ACT	39 adults 6 months post-bariatric surgery I= 19 C= 20	15.3	43.08	89.7	Not reported	27.19 Range = 20.76-38.01	TAU (FU sessions with the bariatric team)	+
Palmeira et al., (2017) Portugal	ACT, CFT, MBCT & MB-EAT	RCT	12 weeks	Weekly group with 2 fortnightly booster	Clinical psychologist and one	73 females self-reporting to be overweight or obese	13	T= 42.35 (SD= 8.58) I=41.9 C=42.7	100	Not reported	T=34,24 (SD=8.58) I=34.82	TAU	+

				sessions at the end.	clinical psychology masters student	and to be experiencing self-stigma I= 36 C=37					C= 33.65		
Palmeira et al., (2019) Portugal	ACT, CFT, MBCT & MB-EAT	RCT	12 weeks	Weekly group with 2 fortnightly booster sessions at the end.	Clinical psychologist and one clinical psychology masters student	females self-reporting to be overweight or obese and to be experiencing self-stigma			100	Not reported		TAU	+
Forbes et al., (2020) Australia	CFT	Uncontrolled pre-post	2 days	Face-to-face group intervention 2 full-day workshops conducted one week	Two psychologists both traine	15 adults with overweight/ obesity reporting at least one	6.7	43.60 Range = 18-62 SD=12.38	100	100	31.23 SD = 5.80	None	+

				apart, with each workshop consisting of five sessions.	d in CFT	stigmatising experience and scoring above cut off on internal stigma and low self-compassion					Range = 27.64 to 58.14			
Haley et al., (2022) USA	SC	Uncontrolled pre-post	3 days	Two face-to-face sessions of 1.5 hours each then one 75-minute session	A doctoral-level clinical health psychology student who was supervised by two licensed	13 university students and staff	13.3	34.7	100	80	37.3	None	+	

					clinical psychologists.								
Bahadori et al., (2022) Iran	ST	RCT	8 weeks	Individual face-to-face sessions	Not reported	32 adults self-referring to Mehr Counseling and Psychology Center in Tehran I= 16 C=16	0	T= 50.5 I= 45.2 C= 56	T:53.1 I: 50 C: 56.3	Not reported	T= 33 I= 32.75 C= 33.25	WL	ø

1.4.2 Interventions

Of the included studies, six described themselves as using primarily an ACT approach based on the original manual by Hayes et al., (1999) and were delivered by ACT-trained therapists.

A combined approach was taken by Palmeira et al., (2017;2019) in their KG-Free program (KG-Free) for which they adapted experiential exercises taken from ACT, CFT, MBCT and MB-EAT. Two studies were based on self-compassion with one (Haley et al., 2022) utilising an approach based largely on the work of Neff. (2011) and the other (Forbes et al., 2020) a CFT based approach (Gilbert, 2009). The final study took a ST approach (Bahadori et al., 2022).

Of the twelve included studies, six solely targeted weight self-stigma, four focused on body image and two investigated both outcomes. Weight self-stigma was a primary outcome measure for eight of the studies (Forbes et al., 2020; Haley et al., 2022; Levin et al., 2018; Lillis et al., 2009; Palmeira et al., 2017;2019; Potts, 2018; Potts et al., 2022). Body image was a primary outcome measure in five of the studies (Bahadori et al., 2022; Haley et al., 2022; Pearson et al., 2012; Weineland et al., 2011,2012) and a secondary outcome measure in one study (Forbes et al., 2020). Body weight was a primary outcome in three studies (Bahadori et al., 2022; Potts, 2018; Potts et al., 2022), a secondary outcome in five studies (Forbes et al., 2020; Levin et al., 2018; Lillis et al., 2009; Palmeira et al., 2017; 2019) and was not used as an outcome measure in five studies (Haley et al., 2022; Pearson et al., 2012; Potts et al., 2022; Weineland et al., 2011;2012)

Three studies utilised short-term workshop interventions (Forbes et al., 2020; Lillis et al., 2009; Pearson et al., 2012). Two utilised longer-term group-based sessions (Palmeira

et al., 2017; 2019), Three took the form of guided self-help plus telephone or e-mail coaching (Levin et al., 2018; Potts, 2018; Potts et al., 2022), two employed individual sessions plus guided self-help (Weineland et al., 2011;2012) and two utilised individual sessions only (Bahadori et al., 2022; Haley et al., 2022).

1.4.3 Control Groups

To compare the effects of their chosen intervention, five studies used waiting list (WL) control groups (Bahadori et al., 2022; Lillis et al., 2009; Pearson et al., 2012; Potts, 2018; Potts et al., 2022). Four studies (Palmeira et al., 2017;2019; Weineland et al., 2011, 2012) compared to treatment as usual (TAU) and three did not utilise a control group (Forbes et al., 2020; Haley et al., 2022; Levin et al., 2018)

1.4.4 Outcome Measures

Two different measures of internal/self-stigma were used and nine different measures of varying aspects of body-image satisfaction were used. Lillis et al., (2009) used an early version of the Weight Self Stigma Questionnaire (WSSQ) which was a thirty-item questionnaire developed specifically for the study. A later twelve-item version of the WSSQ (Lillis et al., 2010) was used by Potts 2018, Potts et al., 2022, and Palmeira et al., 2017; 2019. The 11-item Weight Bias Internalization Scale (WBIS; Durso & Latner, 2008) was used by Haley et al., (2022) and Forbes et al., (2020). To measure body image there were a variety of measures used. Pearson et al. (2012) made use of the Physical Appearance State and Trait Anxiety Scale (PASTAS-S; Reed et al., 1991) and the Preoccupation with Eating, Weight and Shape Scale (PEWS; Neimeier et al., 2002) and The Body Shape Questionnaire (BSQ; Cooper et al., 1987). In their two studies, Weineland et al,. (2011; 2012) utilised the Eating disorders Examination Questionnaire (EDEQ) weight and shape concern subscales (Fairburn & Beglin 1994). Forbes et al., (2020) used a

modified version of the Body Image Concern (BIS) subscale of the Body Image and Body Change Questionnaire (Ricciardelli & McCabe, 2002) and the six-item shame subscale of the Weight and Body Related Shame and Guilt scale (WEB-SG; Conradtetal.,2007).

1.4.5 Quality

The quality of the included studies was checked using the American Dietetic Society quality checklist (American Dietetic Association, 2012). See Appendix B for more detail on the given ratings.

1.4.6 Overall Findings

Of the eight TWM interventions that investigated self-stigma as an outcome, seven of them were in favour of TWM approaches as a way to reduce experiences of weight self-stigma. Compared to controls, four studies (Lillis et al., 2009; Palmeria et al., 2017; Potts, 2018;2022) reported decreased levels of stigma at post/FU with effect sizes ranging between .14 – .24 (partial η^2) and between 0.84 - 1.07 (Cohen's *d*). Three did not use control groups (Levin et al., 2017; Forbes et al., 2020; Palmeira et al., 2019) but when comparing pre to post/FU scores they reported effect sizes which ranged between .25 – .52 (partial η^2) and between 0.96- 2.63 (Cohen's *d*). One pre-post study by Haley et al., (2020) did not find a significant effect of the intervention on this outcome and thus didn't report an effect size. Please see Table 2 below for a summary of results.

Table 2

Outcomes from Included Studies

Intervention	Author, date, and location	Body-image measures	Self-Stigma measures	Body weight	Results and conclusions (Significance and effect size where available)
ACT	Levin et al., (2018) USA		Weight Self-Stigma Questionnaire (WSSQ; Lillis et al., 2010),	Y (objective and self-report)	**Weight self-stigma** Significant reduction in total stigma from pre to 3-month FU ($p < .001$; $d = 2.63$), and from post to 3-month FU ($d = .51$) Significant reduction in self-devaluation from pre to 3-month FU ($p < .001$; $d = 2.23$), and from post to 3-month FU ($d = .09$) Significant reduction in fear of stigma from pre to 3-month FU ($p < .001$; $d = 2.25$) and from post to 3-month FU ($p < .05$; $d = .72$). **Weight** Trend towards reduction in objective weight from pre to post ($p = .06$; $d = .34$) Slight increase in self-reported weight from pre to 3-month FU.

Intervention	Author, date, and location	Body-image measures	Self-Stigma measures	Body weight	Results and conclusions (Significance and effect size where available)
ACT	Lillis et al., (2009) USA		Weight Stigma Questionnaire (WSQ; (Lillis et al., 2009)	Y (Objective)	**Weight self-stigma** Significant reduction in stigma from pre to post ($p < .05$; $d = .63$) Intervention outperformed control at 3-month FU ($p < .001$; partial $\eta^2=.23$; $d = 1.07$) **Weight** Significant reduction in weight from pre to 3-month FU ($p= <.05$; $d = .05$) Intervention outperformed control at 3-month FU ($p < .01$; partial $\eta^2=.11$; $d =.68$
ACT	Pearson et al., (2012) USA	The Physical Appearance State and Trait Anxiety Scale (PASTAS; Reed et al., 1991) The Preoccupation with Eating, Weight and Shape Scale (PEWS; Neimeier et al., 2002)			**Body-image** *Preoccupation with eating, weight, and shape* Significant reduction in distress related to thoughts about weight and body shape from pre to post ($p=.02$; $d =.64$). Intervention outperformed control at post ($p = .01$; $d =1.40$) *Body anxiety*

Intervention	Author, date, and location	Body-image measures	Self-Stigma measures	Body weight	Results and conclusions (Significance and effect size where available)
					Significant reduction in body anxiety from pre to post ($p < .01$; $d = 1.27$) Intervention outperformed control at post ($p < .05$; $d = .55$)
ACT	Potts (2018) USA		Weight Self-Stigma Questionnaire (WSSQ; Lillis et al., 2010).	Y (Self-report)	**Weight self -stigma** The intervention group (E-mail and telephone) outperformed control at post in reducing stigma ($\eta^2 = .14$), as did telephone only ($\eta^2 = .23$) No significant differences at post were found between the two active intervention conditions. **Weight** Trend towards reduction in weight (E-mail and telephone) outperformed control at post ($\eta^2 = .10$)
ACT	Potts et al., (2022) USA		Weight Self-Stigma Questionnaire (WSSQ ; Lillis et al., 2010).	Y (Self-report)	**Weight self-stigma** Significant reductions were found from pre to post in the e-mail intervention group ($p < .001$)

Intervention	Author, date, and location	Body-image measures	Self-Stigma measures	Body weight	Results and conclusions (Significance and effect size where available)
					Significant reductions were found from pre to post in the telephone intervention group (*p < .001)* The e-mail intervention group outperformed control at post (*p < .05).* The telephone intervention group outperformed control at post (*p < .01).* There was a significant condition vs time interaction effect found (*p* < .001*; d* = 0.84) **Weight** No significant improvements in BMI in either intervention group.
ACT	Weineland et al., (2011). Sweden	The Body Shape Questionnaire (BSQ; Cooper et al.,1987) Eating disorders examination questionnaire			**Body image** Intervention outperformed control at post with a significant reduction in body image dissatisfaction (*p* = 0.02; partial η^2 = .13). Intervention outperformed control at post with a significant reduction in shape concerns *p* = .009; partial η^2 = .17)

Intervention	Author, date, and location	Body-image measures	Self-Stigma measures	Body weight	Results and conclusions (Significance and effect size where available)
		(EDEQ)—weight and shape concern subscales (Fairburn & Beglin 1994)			Intervention outperformed control at post with a significant reduction in weight concerns (p = .03; partial η^2 = .12)
ACT	Weineland et al., (2012). Sweden	The Body Shape Questionnaire (BSQ) Cooper et al., (1987) Eating disorders examination questionnaire (EDEQ)—weight and shape concern subscales (Fairburn & Beglin 1994)			**6-month FU of the previous study by Weineland et al. (2011)** **The above findings maintained:** Intervention outperformed control at 6-month FU with reductions in body image dissatisfaction (p = 0.041; d = 0.77). Intervention outperformed control at 6-month FU with reductions in shape concerns (p = 0.07, d = 0.68). No significant differences were found for weight concerns at 6-month FU.
ACT, CFT, MBCT & MB-EAT	Palmeira et al., 2017;2019) Portugal		Weight self-stigma Questionnaire (WSSQ ; Lillis et al., 2010)	Y (Objective)	**2017:** **Weight self-stigma** Significant reduction in stigma from pre to post (p < .001, d = 0.96).

Intervention	Author, date, and location	Body-image measures	Self-Stigma measures	Body weight	Results and conclusions (Significance and effect size where available)
					Intervention outperformed control at post (p <.001; d = *0.74*) **Weight** Significant reduction in weight from pre to post (p < .05; d = 0.12). Intervention outperformed control at post (p < .01*; d*= 0.13) **2019:** FU study using original intervention sample plus data from the control group who were offered the intervention at a later date. **Weight self-stigma** Significant reduction in stigma from pre to 3-month FU (p < *.001;* partial η^2 = .25) **Weight** Significant reduction in weight from pre to 3-month FU (p < .05; partial η^2 = .18).
Self-compassion	Forbes et al., (2020)	A modified version of the Body Image Concern (BIS)	The Weight Bias Internalization Scale	Y (Self-report)	**Weight self-stigma**

Intervention	Author, date, and location	Body-image measures	Self-Stigma measures	Body weight	Results and conclusions (Significance and effect size where available)
		subscale of the Body Image and body change questionnaire (BCQ) (Ricciardelli&McCabe,2002) was used. 6-item shame subscale of the Weight and Body Related Shame and Guilt (WEB-SG; Conradtetal.,2007)	(WBIS; Durso & Latner, 2008).		Significant reduction in stigma from pre to post (p <.001; η^2 = .52) and from pre to 3-month FU (p <.001) **Body Image** Significant reduction in body dissatisfaction from pre to post (p <.001; η^2 = .53 and from pre to 3-month FU (p <.001). Significant reduction in body shame from pre to post (p < .001; η^2 = .39) and from pre to 3-month FU (p <.002). **Weight** Some reduction from pre to post however this was not significant (p < .062).
CFT	Haley et al., (2022) USA	The Body Image Shame Scale (BISS; Duarte et al., 2015) was used. The Body Appreciation Scale-2 (BAS-2; Tylka & Wood-Barcalow, 2015).	The Weight Bias Internalization Scale (WBIS; Durso & Latner, 2008).		**Body image** No significant effect of intervention on body shame from pre to post (d = 0.09). Significant effect of intervention from pre-post with improvements in body appreciation (d = 0.80). **Weight self- stigma**

Intervention	Author, date, and location	Body-image measures	Self-Stigma measures	Body weight	Results and conclusions (Significance and effect size where available)
					No significant effect of intervention on IWB from pre-post (d = 0.06).
ST	Bahadori et al., (2022) Iran	Multidimensional Body-Self Relations Questionnaire MBSRQ–AS (Cash, 1990)		Y (Objective)	**Body image** Significant improvement in body image from pre to post ($p < 0.001$; $\eta^2 = .86$) Intervention outperformed control ($p < 0.001$; $\eta^{2 =} 0.17$) An interaction effect between group and time was found ($p < 0.001$; $\eta^2 = .80$) **Weight** Intervention outperformed control ($p < 0.00$; $\eta^{2 =} .29$) Significant reductions in weight from pre to post ($p < 0.001$) $\eta^2 = .70$) An interaction effect between group and time was found ($p < 0.001$; $\eta^2 = .46$)

Of the six TWM interventions that investigated body image as an outcome, all of them were in favour of TWM approaches as a way to improve some aspect of body image or to reduce distress about one's body image. Four studies reported improvements in some aspect of body image with effect sizes of .17 (partial η^2) and between 0.68- 1.4 (Cohen's *d*) when compared to controls (Bajadori et al., Pearson et al., 2012; 2022; Weineland et al., 2011;2012). Two studies that didn't use control groups (Forbes et al., 2020; Hayley et al., 2022;) also reported improvements in body image when analysing pre-post/FU intervention scores with effect sizes of 0.8 (Cohen's *d*) and between .39- .53 (partial η^2).

Regarding the effect of TWM interventions on body weight, the results indicate that four of the eight were in favour of these interventions as a way to reduce body weight. Compared to controls, reductions in body weight were reported at post/FU in three studies (Lillis et al., 2009; Palmeira et al., 2017; Bahadori et al., 2022) with effect sizes ranging between 0.13- 0.68 (Cohens *d*) and .29 (partial η^2). Significant reductions in weight from pre- 3-month FU was found in one study by Palmeria et al., (2019) reporting an effect size of .18 (partial η^2). Four studies (Levin et al., 2018; Forbes et al., 2020; Potts, 2018; Potts et al., 2022) did not find any significant effects of intervention on body weight.

1.4.6.1 TWM Interventions on Weight Self-Stigma Outcomes

Two uncontrolled ACT interventions significantly reduced weight self-stigma from pre-post/FU. The first of which used a seven-week guided self-help approach plus weekly coaching (Levin et al., 2018). At three-month FU they found the following reductions in self-stigma ($p < .001$; $d = .51$), and two subscales of the construct: self-devaluation ($p < .001$; $d = 0.09$) and fear of stigma ($p < .001$; $d = .72$). The second, the twelve-week KG-Free group programme with two fortnightly booster sessions found similar reductions in self- stigma at three-month FU (Palmeira et al., 2019; $p < .001$; partial $\eta^2 = .25$). Self-

stigma was also significantly reduced compared to WL control in three studies, one of which was a one-day ACT workshop (Lillis et al., 2009; $p < .001$, partial $\eta^2 = .23$; $d = 1.07$) and the remaining two compared WL with an ACT based guided-self-help over an eight-week period with either weekly e-mail or telephone support (Potts, 2018; both e-mail and telephone $\eta^2 = .14$; telephone $\eta^2 = .23$; Potts et al.,2022; both e-mail and telephone $p < .05$; telephone $p < .01$). Compared to TAU, ACT interventions significantly reduced self-stigma in another study utilising the KG-Free programme by Palmeira et al., (2017; $p < .001$; $d = 0.74$). A three-session group self-compassion intervention for women did not significantly reduce internalised weight bias from pre to post in one uncontrolled study ($d = 0.06$; Haley et al., 2022). However, a two-day group CFT workshop (Forbes et al., 2020) did find that this compassion-based intervention significantly reduced self-stigma at post-intervention ($p < .001$; $\eta^{2=}$ 0.52) and at 3-month follow-up ($p < .001$).

1.4.6.2 TWM Interventions on Body Image

A three-session self-compassion group intervention for women did not significantly reduce body shame ($d = 0.09$) but it did however increase body appreciation from pre to post ($d = 0.80$) in one uncontrolled study (Haley et al., 2022). A two-day CFT workshop (Forbes et al., 2020) significantly reduced body dissatisfaction ($p < .001$ $\eta^2 = 0.53$) and body shame ($p < .001$ $\eta^2 = 0.39$) at post-intervention and at 3 month follow up respectively ($p < .001$; $p < .002$).

A one-day ACT group workshop (Pearson et al., 2012) also yielded significant reductions in distress related to thoughts about weight and body shape ($p = .01$; $d = 1.40$) and body anxiety ($p = .025$; $d = 0.55$)) compared to WL control. Furthermore, an ACT-based two-session study (plus six-week internet self-help and weekly phone calls) by Weineland et al. (2011) led to significant reductions in the post-intervention group

compared to TAU for BID (p = .02; partial η^2 = .13), body shape concern (p = .009, partial η^2 = .17) and weight concerns (p = .03, η^2 = .12). This significance was maintained at six-month FU for body dissatisfaction (p = .04, d = 0.77), body shape concerns (p = .07, d = 0.68) but not for body weight concerns (Weineland et al., 2012). Eight sessions of individual ST also produced positive improvements in body image in the ST group from pre to post (p < .001) η^2 = 0.86). There were also significant improvements in body image in the ST group when compared to the WL control (p < .001), η^2 = 0.17). The researchers also observed a significant interaction effect of time vs group (p < 0.001) η^2 = 0.80; Bahadori et al., 2022).

1.4.6.3 **TWM Interventions on Body Weight**

A one-day ACT workshop (Lillis, 2009) significantly reduced participants body-weight as measured by BMI from pre-3-month follow-up (p < .05; d = 0.05). Furthermore, participants in the ACT group showed significant reductions in their BMI when compared to the WL control (p < .01, partial η^2 = .11, d = 0.68). An eight-week ACT-guided self-help program (Potts, 2018) with either e-mail or telephone support reported a trend towards reductions in participants' weight (BMI) for both conditions when compared with WL control (η^2 = .09) with the greatest effect being in the telephone support condition (η^2 = .15). A similar later study from Potts et al., (2022) also did not report any significant results or trends towards post-intervention differences in BMI in either e-mail or telephone condition when compared to WL control. Reductions in weight were found for the ACT+ KG-Free program (Palmeira et al., 2017) who found a significant reduction in pre- vs post-weight in the intervention group (p < .001, η^2= 0.24) and they observed that the intervention led to significant reductions in weight (p < *.05; d*= 0.09) when compared to TAU. In their follow up study Palmeira et al., (2019) found again that the KG-Free intervention led to significant reductions in weight from pre- 3-month FU (p < .05, =

partial $\eta^2 = .18$). Levin et al., (2018) reported an increase in self-reported weight from pre-FU in their seven-week guided self-help intervention. However, they also reported a trend toward a decrease in measured weight loss ($p = .06$, Cohen's $d = .34$) although this was not significant. An eight-session ST intervention (Bahadori et al., 2022) was also successful at significantly reducing participants' weight compared to WL control ($p < 0.001$); $\eta^2 = 0.29$). They also reported a significant decrease in pre- vs post-weight in the intervention group ($p < 0.001$; $\eta^2 = 0.70$) and a significant interaction of intervention/time ($p < 0.001$; $\eta^2 = 0.46$). A two-day CFT workshop did not report any significant differences in weight loss of participants at post-intervention or three-month follow-up (Forbes et al., 2022).

1.4.6.4 Mediation Analyses

Four studies also carried out mediation analyses investigating whether the effects on stigma, body image, and/or weight were mediated by other factors. Pearson et al., (2012) found that the effect of the ACT intervention on body image was mediated by scores on the AAQ $p = 0.01$; $d = .68$), AAQW ($p = 0.00$; $d = 1.28$). Palmeira et al., (2019) found that significant changes from baseline to post-treatment in self-stigma were mediated by psychological flexibility as measured by the AAQW ($p < 0.01$, $d = 3.00$). Scores on the AAQW also mediated improvements in body image ($p < .05$) in the follow-up study by Weineland et al., (2012). Lillis et al., (2009) also reported that improved psychological flexibility in general as measured by the AAQ-mediated change in self-stigma ($p <.05$) but not weight (BMI). Weight-related psychological flexibility (measured by the Acceptance and Action Questionnaire for Weight-Related Difficulties; AAQW) significantly mediated self-stigma ($p <.05$) and weight (BMI; $p < .03$). Breath-holding, a measure of distress tolerance, also mediated self-stigma ($p <. 05$) and BMI ($p <.03$). Post hoc analyses showed that the effect of the intervention on stigma was not indirectly attributed to weight loss in the intervention group.

1.4.7 Risk of Bias Within Studies

Of the seven studies that employed a randomised design, seven described a suitable method of randomisation such as random numbers table (Lillis et al., 2009), computerised, (Palmeira et al., 2017; Potts et al., 2022; Weineland et al., 2011, 2012), coin flip (Pearson et al., 2012), simple random sampling (Bahadori et al., 2022). One study by Potts, (2018) did not describe how participants were randomised. Improper randomisation can lead to selection bias which in turn can produce over or underestimates of effect size (Saltaji et al., 2017). The four remaining studies did not utilise control groups and thus did not randomise participants.

Blinding of participants was not carried out in any study which is not unusual in this type of research. In two studies (Palmeira et al., 2017;2019) data collection was carried out by psychologists blinded to participants treatment condition. However, in the majority of the studies it was not possible to blind assessors to the participants group as the measures were all self-report therefore increasing the risk of performance and detection bias.

1.5 Discussion

This review aimed to elucidate the effectiveness of TWM interventions on self-stigma body image and body weight in adults with overweight/obesity. In summary, the findings highlight the distinct lack of research in this area. Of the eight TWM interventions that investigated self-stigma as an outcome, seven of them were in favour of TWM approaches as a way to reduce experiences of weight self-stigma. In four studies, the TWM intervention significantly outperformed a control group and in three studies there was significant pre-post reductions in self-stigma. Similarly, for the studies that investigated body-image as an outcome, six out of six studies reported significant improvements in some aspect of the construct. Two of which were compared to controls and four compared

pre-post change. In relation to body weight, four of eight studies were in favour of TWM interventions as a way to reduce body weight. Three of which outdid control conditions and one compared pre- post scores. Overall, the available research presented by this review indicates that TWM interventions are an effective way to reduce self-stigma and improve body image. Findings are more mixed when it comes to their effects on body weight and the effect sizes tended to be smaller than for stigma and/or body image. These findings must be taken with caution due to the limited number of studies investigating the area. There were also various methodological problems noted within the studies such as a lack of allocation blinding, small sample sizes, non-randomised designs and only minimal long-term follow up. These factors also cast doubt on the validity of some of the findings and have been noted in earlier reviews (Griffiths et al., 2018).

1.5.1 Intervention Model

The majority of the studies aiming to have an effect on self-stigma utilised a primarily ACT approach combined with self-compassion, mindfulness and MB-EAT. All of which had a positive effect on the construct with medium or large effect sizes. Of the two strictly self-compassion-based studies, only one yielded significant results. Due to the lack of research using self-compassion as a model and the overlap of TWM components used within some of the studies , it is not possible to draw conclusions as to whether ACT is superior in this population when addressing self-stigma. More research is warranted which uses compassion-based interventions.

There was more diversity in the models used to try to improve body image and body weight which included ACT, self-compassion, and ST. In relation to body image all interventions improved some aspect of the construct with medium to large effect sizes

indicating that a variety of TWM intervention models may be useful in improving this construct.

Regarding body weight the results were slightly less clear. There were a number of studies which reported positive findings with large effect sizes which utilised different models including ST, ACT and ACT combined with self-compassion, mindfulness and MB-EAT (Bahadori et al., 2022; Lillis et al., 2009; Palmeira et al., 2017,2019). The ACT intervention by Levin et al., (2018) actually reported an increase in self-reported weight at 3 month follow up, despite a trend towards pre-post weight loss. Although prior research in adult populations has illustrated accord between objective and self-report weight (Pursey et al., 2014), there have been reports of the unreliability of recording this variable in this way (Rowland, 1990; Smyth & Stone, 2000) and thus it is hard to draw conclusions from these findings as this prevented a valid weight assessment over time. Furthermore, this study also had a relatively high attrition rate and used a completers analysis, all of which cast some doubt on the validity of the findings. Another two ACT interventions (Potts, 2018; Potts et al., 2022) also failed to see significant changes in body weight although one study reported a trend towards weight loss. These studies also used self-report weight and thus the same points apply as mentioned above for Levin et al., (2018). All three studies used a guided self-help format, and it could be that this was not the most helpful type of intervention to facilitate weight loss as some of the face-to-face methods.

1.5.2 Intervention Design

All but one study (Haley et al., 2022) investigating self-stigma as an outcome reported large effect sizes, within this there was a mix of intervention types and lengths suggesting that there can be flexibility in the way in which interventions are delivered. The three-session self-compassion intervention study by Haley et al., (2022) did not find a

significant post improvement in internalised weight bias as expected, nor did they find a significant difference in self-compassion scores post treatment. In contrast, a longer two full-day CFT workshop by Forbes et al., (2020) did yield significant results. In contrast to previous similar studies (Rahimi-Ardabili et al., 2018; Smeets et al., 2014), Haley et al., (2022) did not see significant increases in self-compassion as they had predicted, reporting that baseline levels of self-compassion were lower than those seen in previous research. It could be that a fear of self-compassion (Kelly & Carter, 2015) failed to facilitate significant increases in self-compassion and given that self-compassion has been shown to mediate relationships between self-stigma (Vowles et al., 2014) it could be proposed that this fear of self-compassion, meant the intervention was not sufficient to increase participants self-compassion and thus have an influence on their levels of internal weight stigma. Future research could investigate fear of self-compassion as a moderator intervention effectiveness in relation to internal weight stigma. Furthermore, Haley et al., (2022) used a completers analysis rather than intention to treat and thus it is possible that results were biased towards characteristics of those that stayed in the intervention until the end.

Regarding body image, all studies of varying lengths and types found TWM interventions to have a significant effect on some aspect of body image with no clear indication of whether shorter or longer interventions yielded better results. Again, this suggests that there can be flexibility in the way interventions are delivered.

It is also important to note that there is some crossover between the different intervention models and thus it is difficult to conclude whether one approach is simply more effective than another. For example, one study by Vowles et al., (2014) which utilised an ACT model found that self-compassion mediated outcomes on chronic pain, suggesting that ACT had some effect on levels of self-compassion in participants without

this being an explicit target of the intervention. It has been suggested that there are in fact many parallels between components of ACT and self-compassion (Neff & Tirch, 2013). Furthermore, the studies by Palmeira et al., (2017;2019) and Lillis et al., (2009) explicitly utilised components from different TWM interventions and thus it is hard to ascertain which part of the intervention was the main facilitator of change. They did however find that psychological flexibility, a principal component of ACT, mediated the reductions in self-stigma (Palmeira et al., 2019). Three further studies too found that psychological flexibility mediated self-stigma outcomes and thus future research could benefit from directly targeting psychological flexibility as a way to address self-stigma.

1.5.3 Participants

The studies included both clinical and non-clinical participants in their studies with no clear difference in outcomes between the two. The majority of studies had wide inclusion criteria and did not exclude participants with any particular physical health problems thus improving their ecological validity as a large percentage of individuals with overweight/obesity live with chronic health conditions (Ezzatti et al., 2004). Unfortunately, none of the studies reported any information relating to physical health. It would be interesting for future research to investigate whether having a co-morbid physical illness has any impact on outcomes from certain treatment models.

1.5.4 Limitations and Future Research

There are some important limitations to note. Firstly, it was not possible to complete a meta-analysis of the combined data due to the heterogeneity of the study designs (varying outcomes, data points, and analyses). This heterogeneity includes variations in final data collection points, where some studies included data collection at FU which ranged from 3-6 months and others did not collect FU data at all. Furthermore, all the studies were

different lengths. This is likely to impact results, especially regarding weight loss as this variable is likely to be affected by time. Because of our inclusion criteria, qualitative studies were excluded from this review. Although this means we lost richness of data and cannot really understand on an individual level what it's like to experience stigma or poor body image, or how an individual may internalise their experiences, given the aim of this review it was felt that it would be more helpful to the reader to provide generalised conclusions about what works for this population. Although qualitative data on this subject would be very valuable and interesting and future research is encouraged, we believe that it would not be as helpful from a psychological service perspective to have very subjective individual accounts of the effectiveness of interventions, but rather whether interventions are more or less effective for the effective majority is likely to be more useful for service development and understanding what intervention might be most helpful for the majority of individuals with overweight/obesity.

Some studies also combined elements from different TWM interventions making it difficult to ascertain exactly which part of the intervention was facilitating the change. Quality checks highlighted that there was likely to be bias across the included studies due to a lack of allocation concealment and attention conditions. A previous review reported that many TWM interventions, while they outperform inactive controls, do not significantly outperform other more active controls such as components of CBT or therapeutic writing. (Stynes et al., 2022). Thus, future studies could include an attention control condition to control for the benefits that may come from simply engaging in psychological intervention. There was also a lack of ecological validity in the studies due to the significant homogeneity of included participants. The majority were adult, Caucasian females under the age of 40 and although this may be a good representation of those who are likely to attend weight management programs (Crane et al., 2017) it is not a

good representation of the wider overweight and obese population which is more heterogenous (Baker, 2022). Aside from the lack of diversity in the included studies that did report ethnicity demographics, fifty percent of the included articles did not report race or ethnicity at all, a problem that has been reported previously in relation to ACT studies (Woidneck et al., 2012) and mirrors a more recent cohort study which highlighted a similar figure in clinical trials (Turner et al., 2022). This is important to highlight as there are cultural variations in responses to the various outcomes included in the studies. For example, stigma in general is culturally bound and there are differences in the way different cultures view and respond to it (Yu & Mak, 2022). Research has elucidated differences in the way different cultural groups internalise weight related stigma and that being "fat" is not always internalised negatively (Brewis et al., 2015). Research has also shown that culture impacts levels of self-compassion (Neff et al., 2008) and relationships between compassion and wellbeing (Arimitsu et al., 2019). Both of these factors are important to consider and may impact the way in which interventions are delivered and their focus. Future research should make sure to provide demographic information relating to ethnicity and more diverse populations could ascertain whether these interventions would also be successful when working with different cultural groups. Another point to note is that there is still controversy surrounding what constitutes a TWM intervention, and this definition is constantly developing. Many parallels have been noted between components of TWM models (Neff & Tirch, 2013) and thus it may be difficult to conclude exactly which element of the model is having the greatest effect on change. Furthermore, no studies were designed to compare TWM interventions against each other, so it is not possible to draw conclusions as to which interventions are more helpful than others.

1.5.5. Conclusion

In conclusion, the results of this review suggest that TWM interventions are promising for reducing weight self-stigma and improving body Image of individuals with overweight/obesity. Results were less clear for body weight. Future research using more rigorous randomised controlled trial designs with larger samples and more diverse groups is warranted. Investigations into the effects of different therapy delivery methods for example in person vs online vs guided self-help could be an interesting direction for future research in this area.

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Chapter 2 The Relationship between Stigma and Body Image Post Bariatric Surgery: The role of Self-Compassion

2.1 Abstract

Unfortunately, weight stigma is commonplace and has been associated with an array of negative consequences for individuals with obesity including mood disorders and poor body image. Bariatric surgery is a common choice for weight loss, and individuals often hope it will improve their body image. Body image after surgery is complex and individuals do not always see improvements. We investigated the relationships between internal and external stigma, body image and excess weight loss (EWL) and the moderating effect of self-compassion after bariatric surgery. Participants in this cross-sectional study had undergone bariatric surgery at one of three NHS bariatric services within the last 5 years (n = 87). They were predominantly female (88.5%), White British (90.8%) and the majority (55%) were aged over 45. Participants completed a battery of online questionnaires including measures of body image satisfaction, internal and external stigma, mood and self-compassion. Results showed self-compassion was associated with better body image, and that the relationship between internal stigma and body image was moderated by self-compassion such that for participants with high levels of self-compassion, their appearance evaluation was dependent on their level of internal stigma, whereas participants with lower levels of self-compassion evaluated their appearance poorly irrespective of their experience of stigma. Stigma and body image were not found to be associated with EWL. This study suggests that increasing self-compassion in bariatric surgery candidates could be a helpful intervention to improve outcomes from surgery.

Keywords Self-Compassion, weight stigma, body image, bariatric, obesity, third wave

2.2 Introduction

Obesity is a major public health concern (Rosengren, 2021). Ranked as the fifth most prevalent cause of illness and death worldwide (Safaei et al., 2021), this places a large financial strain on healthcare systems (Finkelstein,2009). Body Mass Index (BMI)(height/ weight^2) is a widely used measure of obesity and individuals are classified as obese category if their BMI is above 30 (Akram et al., 2000).

Close associations between obesity and reduced quality of life have been well documented (Darebo et al., 2019; Hrabosky & Thomas, 2008). Obesity is related to an increased risk of health conditions such as Type 2 diabetes, high blood pressure, heart disease, stroke, osteoarthritis, certain cancers (Kim et al., 2020) and mood disorders such as depression (Hrabosky & Thomas, 2008, Luppino et al., 2010) and anxiety (Allison et al., 2009). All of which have been shown to have a detrimental effect on the quality of life of individuals with obesity (Fontane & Barofsky, 2001).

The aetiology of obesity is complex and multifactorial. Much research has illustrated that obesity is likely the result of both individual and societal influences such as genetics, psychological factors and the environment (Wyatt et al., 2006). Adverse life Experiences (ACES), which are highly traumatic events that happen to an individual during their childhood or adolescence (Felitti et al., 1998), have been shown in a large array of research to be closely associated with obesity and may be a risk factor (Gardner et al., 2019; Schroeder et al., 2021).

Interventions that target obesity usually focus on diet and exercise and these do not often yield long-term results (Wadden & Fray, 1997). While these interventions can produce significant weight-loss in the short term (Shaw et al., 2010), many people end up regaining the weight or even exceeding their previous weight (Loveman et al., 2011; Perri,

1998). Bariatric surgery has been described as being the principal method of successful weight loss (Bocchieri et al., 2002). The prevalence of bariatric surgery is ever-increasing worldwide (Welbourn et al., 2019) and has been related to improvements in anxiety and depression (Gill et al., 2019), well-being (Sarwer,2005) and longevity (Shubeck, 2018). This being said, studies have shown that it is also common for post-surgery patients to regain weight (Heinberg et al., 2020; Velapati et al., 2018). Research has shown that two years after surgery is when this is most commonly seen (Shah et al., 2006). A large Swedish study found that at five years post-surgery, 20-24% of bariatric patients had regained more than 15% of their lost body weight (Brissman et al., 2021). Weight re-gain has been shown to have a demoralising and distressing effect on individuals who feel their last chance has failed (Velapati et al., 2018) often leaving them feeling guilt, shame and hopelessness (Tolvanen et al., 2022) thus worsening their mental health. This highlights the importance of interventions that will help people to maintain their weight loss long-term.

For those who struggle with obesity, problems with body image are one of the most common reasons individuals may decide to try to lose weight (Rosenberger, 2006) or to have bariatric surgery, (Libeton et al., 2004). Disturbance in body image was described by Thompson et al. (1999) as being when one has a distorted perception of their own body. Body image dissatisfaction (BID) is when an individual holds negative views about their appearance. This is proposed to be because of a discrepancy between actual body image (i.e., cognitions, perceptions, and emotions concerning physical appearance and the idealistic body image (i.e., internalised ideals about physical appearance (Cash, 1990).

Unfortunately, bariatric surgery does not necessarily rid people of BID, and concerns about how the body looks after surgery are common (Alegria & Larsen, 2014) and may actually worsen in some cases (Busetto et al., 2018). Due to the rapidity of weight

loss after surgery, individuals are often left with excess skin which they can find aesthetically displeasing and misaligned with their post-surgery body-image aspirations (Steffen, 2012). Not only this but excess skin can also lead to physical health problems which may increase shame and embarrassment (Baillot, A et al., 2013). A recent study found that shame related to body image mediated the relationship between discomfort with excess skin and disordered eating post-surgery (de-Lourdes, 2021). Furthermore, associations have also been highlighted between impairment from excess skin, body image concerns and weight regain post-surgery (Ramalho et al., 2015).

Weight-based stigma is commonplace and is associated with a number of negative consequences in individuals with obesity including BID (Friedman et al, 2008). Stigma can be described as negative attitudes and judgements we have towards others solely based on devalued group characteristics (Scheyett, 2005). Weight-based stigma more specifically, is also widely known as "fat phobia" (Stoll et al., 2022). Unfortunately, individuals with obesity are almost ten times more likely to have been the victim of stigmatising excluding and/or discriminatory experiences based purely on their weight (Brewis, 2018) and these experiences infiltrate many areas of people's lives including employment, relationships and healthcare (Stoll et al., 2022).

Research has shown scoring highly on measures of weight self-stigma has been related to poor quality of life in relation to health (Lillis et al., 2011), poorer weight loss (Lent et al., 2014) and an increased likelihood of drop-out from weight loss interventions (Carels et al., 2009). Weight self-stigma is when individuals de-value themselves because they begin to internalise the negative social perception of others (Corrigan et al., 2006; Lillis et al., 2010; Wang et al., 2004). Both internal and external weight stigma have been found to be associated with poorer outcomes from bariatric surgery (Lent et al., 2014; Raves et al., 2016 & Feig et al., 2020). For example, Pearl et al. (2019) found that

internalised weight stigma was associated with less weight loss at twenty-four months post-surgery. The researchers also found that internalised stigma did not appear to readily reduce following bariatric surgery. This, combined with excess skin and weight regain, can be a psychological minefield for patients (Alegria & Larsen, 2014).

Being able to respond to the self with kindness no matter what the circumstance is widely recognised as being associated with mental well-being (Barnard & Curry, 2001) and is noncongruent with self-stigmatisation or the negative cognitions that may come with poor body image (Durso & Latner, 2008). Originating from Buddhism, relating to the self with kindness and non-judgment, with an awareness of our own suffering combined with the desire to alleviate it is what is known as being self-compassionate (Gilbert, 2009).

Self-compassion interventions with individuals with overweight/obesity have shown promising results. For example, recent reviews have found self-compassion to be beneficial for weight loss (Kearney, 2014), eating behaviours and body image (Braun et al., 2016; Rahimi-Ardabili et al., 2018). Furthermore, a three-day self-compassion intervention significantly improved body appreciation (Haley et al., 2022) and a two-day intervention significantly reduced weight self-stigma and improved participants' body image (Forbes et al., 2020). In bariatric populations having higher self-compassion has been found to be associated with better quality of life and greater satisfaction with body image post-surgery (Pyykkö et al., 2021). It also has been associated with less emotional eating and improved QoL and may buffer against some of the negative effects of stigma in individuals with overweight/obesity (Hilbert et al., 2015; Salas et al; Wong et al., 2019). In pre-bariatric surgery patients, internalised stigma was associated with greater emotional eating with this being less pronounced when participants were more self-compassionate (Braun et al., 2021). Given that poor body image and weight self-stigma are associated with poor mental health, problematic eating behaviours and attrition from health care programs, increasing

self-compassion could therefore be one way of helping people to experience better long-term outcomes from bariatric surgery.

At the time of writing, there appears to be only minimal research investigating the relationship between stigma and self-compassion on outcomes post-bariatric surgery. Given the high rates of poor mental health and weight regain following surgery, it is important to identify processes and factors that might be associated with more positive longer-term outcomes from surgery.

The primary aims of this study were to investigate psychological factors that may impact outcomes from bariatric surgery. More specifically, we were interested in the associations between both external and internal stigma and body image and excess weight loss (EWL) in an adult population of NHS post-bariatric surgery patients. We hypothesised that internal and external stigma would be positively associated with more body image dissatisfaction and less EWL after bariatric surgery, and this would be moderated by self-compassion. For example, would those who had high self-compassion have a better body image and experience more weight loss in spite of high levels of stigma. We predicted that body image orientation would mediate these associations i.e., high external and internal stigma would lead to greater body image preoccupation (higher scores on the appearance orientation (AO) subscale) which will then lead to poorer body image satisfaction. We also predicted that anxiety and depression would significantly reduce after surgery and this association would be stronger in those who had higher self-compassion. Finally, we hypothesised that these associations would still be significant when controlling for ACE''s.

2.3 Method

2.3.1 Co-production and consultation

A focus group was carried out at with three individuals who had undergone bariatric surgery at Bournemouth Hospital, during which the study idea and design were presented to them. Feedback was gathered which suggested that they felt the study was tapping into a valuable area, and they were inspired to share their stories with the group. Group members expressed that they felt the study corresponded to their real-world experiences and concerns.

2.3.2 Recruitment and Participants

Purposive sampling was used to recruit eligible bariatric surgery patients from three NHS bariatric services in England, United Kingdom. A total of n=87 post-bariatric surgery patients took part in the study. Of those, 86 completed all measures. Participants were required to be adults (aged over ≥ 18) who had undergone a bariatric surgery operation within the last five years (≥18 months – 5 years). Exclusion criteria included patients waiting for revisional operations, those who had undergone only a gastric balloon operation, or those lacking the ability to understand English. Informed written consent was acquired from all those who took part. Please see Table 3 below for an overview of the demographics of participants. The majority of participants were aged 45 or over (55%), were female (88.5%) and White British (90.8%). From self-reported weight, the mean weight of participants was 95.5kg. This study was approved by The University of Southampton (ERGO number: 70127) and NHS Health Research Authority (HRA) ethics committees (IRAS number: 311099) in the United Kingdom (See Appendix C).

Table 3

Demographics of Participants

Variable	**%**	Total (n=86)
Age		
25-29	3.4	3
30-34	12.6	11
35-39	18.4	16
40-44	10.3	8
45-49	13.8	12
50-54	21.8	19
55+	19.5	17
Gender		
Female	88.5	76
Male	11.5	10
Ethnicity		
White British English	89.7	77
White British Scottish	1.1	1
White Irish	1.1	1
Other White	6.9	6
White and Black Caribbean	1.1	1
Employment		

Employed FT	46	40
Employed PT	14.9	12
Self-employed	4.6	4
Homemaker	6.9	6
Student	1.2	1
Retired	11.5	10
Unable to work	14.9	13
Surgical method		
Gastric bypass (Roux-en Y)	46	39
Gastric Sleeve	48.9	43
Gastric band	3.4	3
Unsure	1.1	1
No of years post-surgery		
1.5-2	12.9	14
2-3	10.6	7
3-4	44.7	38
4-5	31.8	27
Number of surgeries		
1	93.1	80
2	6.9	6

2.3.3 Procedure

Either at follow-up (FU) appointments or via a recruitment e-mail, participants were invited to take part by clinicians working in NHS bariatric services in England. Participants were offered the chance to take part in the research either via an online survey using Qualtrics (https://www.qualtrics.com), using paper questionnaire packs, or over the telephone with the researcher Participants were given a participant information sheet detailing the research and a consent form either electronically or on paper. Taking part took up to 30 minutes and consisted of independently filling in several questionnaires and demographic information. Participants were able to give optional consent for the researcher to access their bariatric medical record to gather their percentage of EWL and pre-surgery psychometric scores of anxiety and depression (See Appendix D for participant questionnaire pack).

2.3.4 Outcome Measures

Sociodemographic variables were collected including age, gender, ethnicity, employment status, self-reported weight and type and number of bariatric surgeries undergone.

2.3.4.1 Weight self-stigma

The Weight Self-Stigma Questionnaire (WSSQ; Lillis et al., 2012) was used. This is a 12-item scale designed specifically for use with overweight individuals. It is a useful measure to determine someone's level of internalised self-stigma. Higher scores indicate more internalised weight stigma. Good validity and reliability have been illustrated with Cronbach's alpha of 0.88. Cronbach's alpha in the current study was 0.88.

2.3.4.2 External stigma

The Stigmatizing Situations Inventory-Brief (SSI-B; Vartanian, 2015) was used. This is a 10-item self-report measure of lifetime experiences of weight-related stigma. The SSI-B includes items covering a range of sources of stigma including comments from doctors and children, physical barriers and negative assumptions from others. Higher scores indicate more experiences of external stigma. This brief measure has been found to be reliable and valid with a Cronbach's alpha of 0.85 (Vartanian, 2015). In the current study the Cronbach alpha was 0.90.

2.3.4.3 Body image

The MBSRQ-Appearance Scales (MBSRQ-AS; Cash, 2017) was used to measure body-image. This is a 34-item measure that consists of 5 subscales Appearance Evaluation (AE), Appearance Orientation (AO), Overweight Preoccupation (OP), Self-Classified Weight (SCW), and the Body-image States Scale (BASS). Higher scores on the AO and BASS indicate more satisfaction with body image. Higher scores on the AO means more importance is placed on how they look. Higher scores on the OP reflects more anxiety about weight and high scores on the SCW indicates that they perceive themselves to be larger. The measure has been shown to be reliable and valid with Cronbach alphas of 0.87 (AE), 0.86 (AO), 0.55 (OP), 0.89 (SCW), and 0.81 (BASS). The Cronbach alphas in the current study were 0.86 (AE), 0.82 (AO), 0.4 (OP), 0.76 (SCW) and 0.80 (BASS).

2.3.4.4 *Self-compassion*

The Forms of Self-criticising/Attacking and Self-reassuring Scale (FSCRS-SF; Sommers-Spijkerman et al., 2018) was used. This is a 14-item scale developed to measure self-criticism and the ability to self-reassure. The items make up three components: inadequate self, hated self and reassured self. A total score is acquired by reverse scoring the positive

items and calculating a total with lower scores indicating higher self-compassion. The measure has been shown to be reliable and valid in related constructs. (Sommers-Spijkerman et al., 2018). The Cronbach alpha in the present study was 0.93.

2.3.4.5 Depression

The Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) was used. This is a nine-item self-report measure of depression severity. Respondents are asked to rate the frequency with which they have experienced depressive symptoms over the last two weeks on a scale ranging from 0 (not at all) to 9 (nearly every day). Higher total scores indicate higher levels of depression. This is a reliable and well validated measure. The Cronbach alpha in the present study was 0.91.

2.3.4.6 Anxiety

The Generalized Anxiety Disorder Assessment (GAD-7; Spitzer et al., 2006) is a 7-item self-report measure of anxiety severity developed to diagnose generalized anxiety disorder. This is a reliable and well validated measure. Higher total scores indicate higher levels of anxiety. The Cronbach alpha in the current study was 0.92.

2.3.4.7 Adverse childhood experiences

The ACE checklist (Dong et al., 2004) was used as a means to measure experiences of childhood maltreatment using a yes/no format. The ACE has been used in bariatric surgery samples (Lodhia et al., 2014) and has shown good test-retest reliability (≥ 0.65; Pinto et al., 2014). Higher scores on this measure indicate more ACE's. The Cronbach alpha in the present study was 0.76.

With consent, data were also taken from participants bariatric service medical records (n=31). This included pre-surgery scores of anxiety and depression and percentage of Excess Weight-Loss (EWL) post-surgery.

The primary research questions were investigated using a moderation regression analysis. Following the recommendations of Green (1991), for the study to have 80% power at an alpha level of 0.05 the sample required was between 74- 143 participants. Therefore, this study was powered sufficiently.

2.4 Results

2.4.1 Data Analysis

Data were checked using Qualtrics ExpertReview response quality for fatigue or unusual response patterns. IBM SPSS version 27 for Windows (Armonk, NY) and PROCESS macro (Hayes, 2017) was used for all data analyses. Descriptive statistics were used to analyse participant characteristics (see Table 3). As data met psychometric assumptions, Pearson's correlations were used to investigate initial relationships between variables. Data were examined for multicollinearity and these assumptions were met with Variance Inflation factors (VIF) of between 2.33-1.4 (O'Brien, 2007) and a tolerance range of 0.67-0.74 (Kutner et al., 2004).

2.4.2 Bivariate Analyses

In support of our hypotheses, relationships were found between the majority of variables in the predicted directions. (See Table 4 for descriptive statistics and correlations between included variables). Both internal and external weight stigma showed moderate inverse associations with the outcome of body image satisfaction (as measured by the AE and BASS subscales),indicating that more weight stigma was associated with poorer body

image. Internal and external weight stigma were also moderately positively associated with the moderator variable of self-compassion, meaning high levels of weight stigma were associated with having lower self-compassion. Self-compassion was also strongly inversely associated with body image satisfaction (as measured by the AE and BASS subscales), meaning that high self-compassion was associated with better body image.

There were weak correlations between current weight and self-compassion, body image on both the AE and BASS subscales, depression, external stigma and AO. Indicating that having a lower body weight is associated with higher self-compassion, better body image, less depressive symptoms and more orientation to their appearance.

ACEs were moderately positively correlated with external weight stigma and self-compassion, indicating that participants who had experienced higher number of ACEs also reported more experiences of external stigma and were less self-compassionate.

EWL was not associated with either self-compassion or body image satisfaction as measured by the BASS subscale. There was a trend towards significance for the AE subscale indicating that more EWL was associated with better body image. Due to this not reaching significance, and the small sample of data collected for EWL, the planned moderation was not carried out on this variable.

Table 4

Descriptive Statistics and Correlations Between Variables

Variable	N	M (SD)	2	3	4	5	6	7	8	9	10	11
1. Self-compassion	86	24.73 (13.38)	.487**	.409**	-.695**	.014	-797**	.386**	.688**	.786**	-.044	.311**
2. Internal Stigma	86	43.66 (10.20)	---	.456**	-.479**	.109	-.382**	.083	.334**	.327**	.039	.103
3. External Stigma	86	32.21 (21.73)	---	---	-.419**	-.119	-.361**	.315**	.259*	.260*	-.083	.236*
4. Body Image Appearance Evaluation (AE)	86	2.22 (0.86)	---	---	---	.077	.768**	-.160	-447**	-.612**	.252	-.330**
5. Body Image Appearance Orientation (AO)	86	3.52 (0.65)	---	---	---	---	.111	.079	.128	-.035	.154	-.306*
6. Body Image Appearance Satisfaction (BASS)	86	2.48 (0.68)	---	---	---	---	---	-.242*	-.580**	-.676**	.073	-.296**
7. Adverse Life Experiences (ACE's)	85	2.04 (2.18)	---	---	---	---	---	---	.457**	.278*	.271	-.054
8. Anxiety (Post)	87	6.79 (6.20)	---	---	---	---	---	---	---	.774**	-.155	.129

Variable	N	M (SD)	2	3	4	5	6	7	8	9	10	11
9. Depression (Post)	87	7.54 (6.72)	---	---	---	---	---	---	---	---	-.162	.256*
10. Excess weight Loss (%)	35	70.02 (20.03)	---	---	---	---	---	---	---	---	---	-.661
11. Current Weight (Kg)	78	95.12 (27.32)	---	---	---	---	---	---	---	---	---	---

Self-compassion = FSCRS-SF, Internal stigma = WSSQ, External stigma = SSI-B, AE, AO, BASS, SCW, OP= MBSRQ-AS, ACE's = ACE's Q, Anxiety and Depression = PHQ-9 and GAD-7. *p = < .05, ** p = < .01

2.4.3 Moderation Analysis

2.4.3.1 Body image

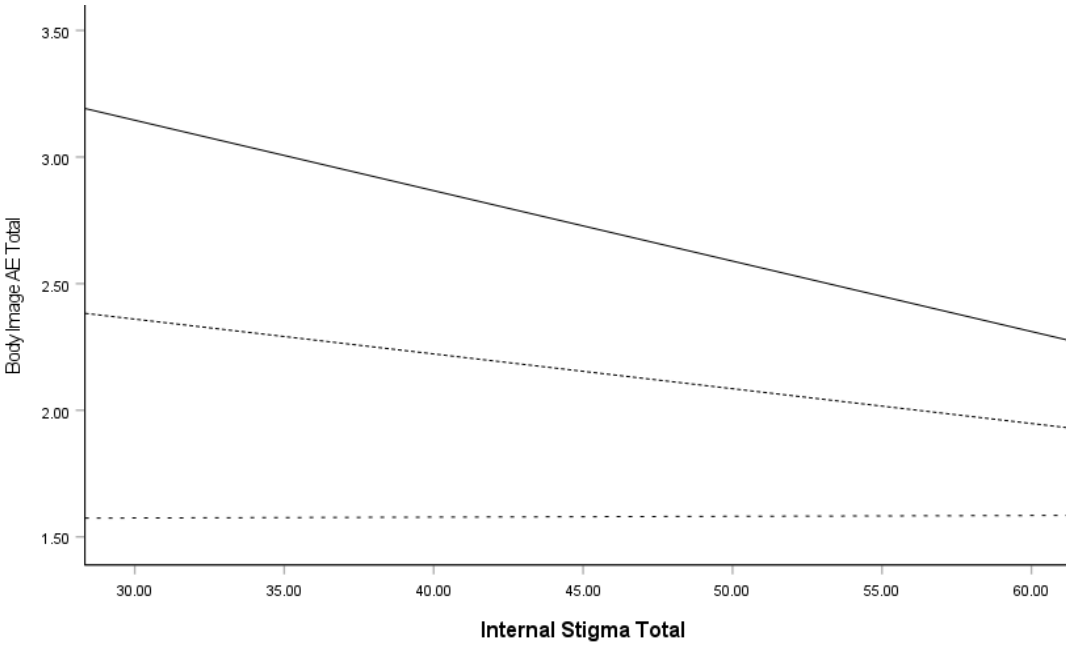
To test our first hypothesis that the relationship between weight stigma and body image post-surgery would be moderated by self-compassion, we followed moderation procedures proposed by Baron and Kenny (1986) using PROCESS macro Model 1 (Hayes, 2017).

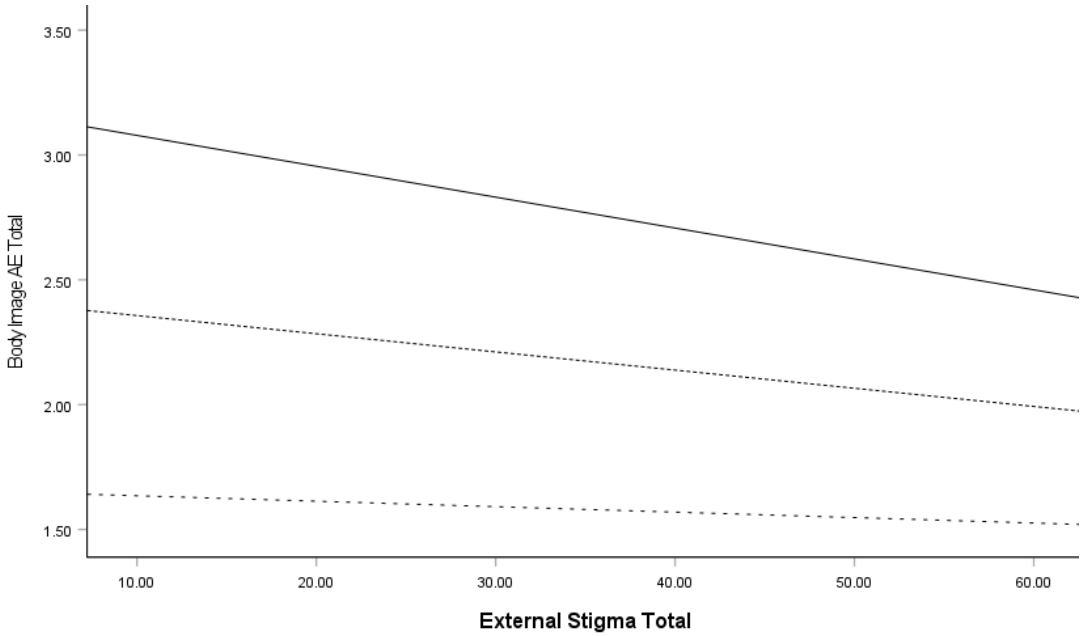
In support of our hypothesis, self-compassion did moderate the relationship between internal weight stigma and body image satisfaction appearance evaluation (AE) where the interaction term between internal weight stigma and self-compassion explained a significant increase in the variance in AE ($\Delta R^2 = .02$, F (1, 82) = 4.05, $p = .048$, N = 86).This indicates that although higher levels of self-compassion (FSCRS-SF 16th percentile = 10) were related to more body image satisfaction as measured by the AE, body image satisfaction was highest for those who reported the lowest levels of internal weight stigma. For those with moderate (FSCRS-SF 50th percentile = 40) and low (FSCRS-SF 84th percentile = 25) levels of self-compassion, body image satisfaction remained low regardless of how much stigma they had internalised (See Figure 2 below for interaction effect). This interaction was still significant when controlling for ACE's ($\Delta R^2 = .03$, F (1, 79) = 5.0, $p = .028$, N = 84). Self-compassion did not moderate the interaction between body image satisfaction (AE) and external weight stigma despite a trend towards significance (unadjusted $\Delta R^2 = .02$, F (1, 82) = 2.8, $p = .098$, N = 86).

Self-compassion did not moderate the interaction between internal weight stigma and body image satisfaction as measured by the BASS subscale, ($\Delta R^2 = .001$, F (1, 82) = .275, $p = .601$, N = 86) or between external weight stigma and BASS ($\Delta R^2 = .003$, F (1, 82) = .567, $p = .454$, N = 86). (See Figure 3 below for interaction effect)

Figure 2

Self-compassion as a Moderator of Stigma and the Body Image Appearance Evaluation (AE) scale

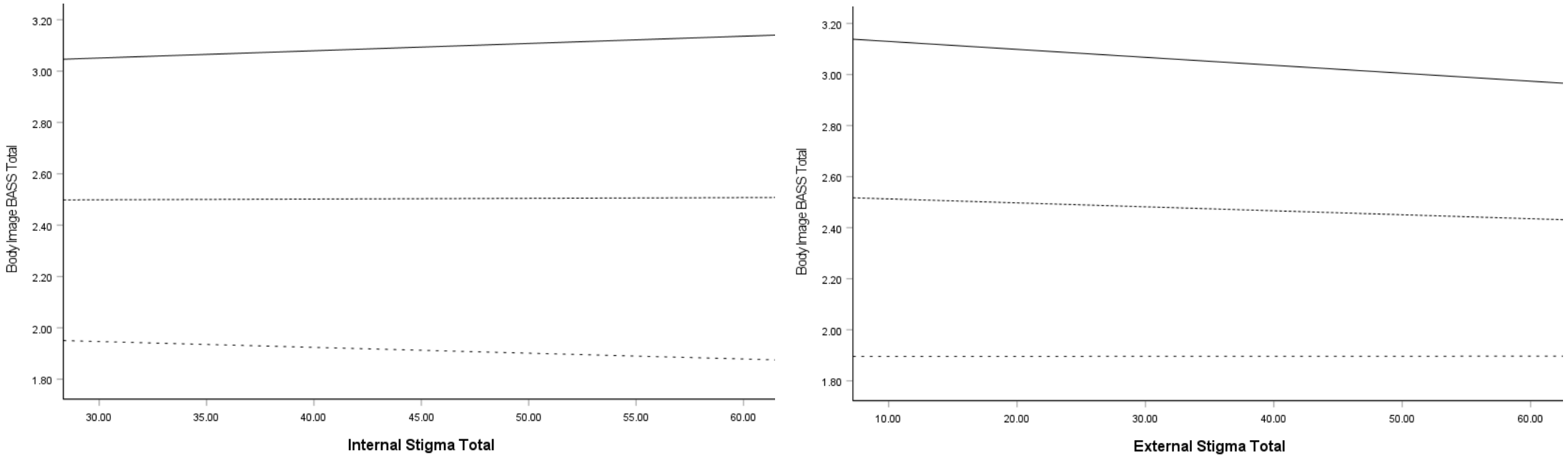




9.92 High self-compassion
24.50 Moderate self-compassion
39.08 Low self-compassion

Figure 3

Self-compassion as a Moderator of Stigma and the Body Image Appearance States Scale (BASS)



9.92 High self-compassion
24.50 Moderate self-compassion
39.08 Low self-compassion

Table 5

Body image Dissatisfaction Predicted from Stigma and Moderator Variable Self-Compassion.

Predictor	*β*	SE	95% CI	*t*
Internal Stigma and AE model (R^2 = .53)				
Internal stigma	-.037**	.013	[-.063, -.011]	-2.88
Self-compassion	-.083***	.023	[-.128, -.038]	-3.67
Internal stigma and self-compassion	.001*	.001	[.000, .002]	2.01
Internal Stigma and AE model when controlling for ACE's (R^2 = .73)				
Internal stigma	-.039**	.014	[-.066, - .013]	-2.29
Self-compassion	-.091***	.023	[-.137, -.045]	-3.94
Internal stigma and self-compassion	.001*	.001	[.000, .002]	2.23
ACE's	.048	.033	[-.019, .114]	1.42
External Stigma and AE model (R^2 = .52)				
External stigma	-.016*	.007	[-.029, -.003]	-2.45
Self-compassion	-.053***	.009	[-.071, -.036]	-5.86
External stigma and self-compassion	.0004	.0002	[-.0001, .001]	1.70

Predictor	*β*	SE	95% CI	*t*
Internal stigma and BASS model (R^2 = .64)				
Self-compassion	-.032*	.016	[-.063, -.001]	-.21
Internal stigma and self-compassion	-.0002	.0003	[-.0008, .0005]	-.56
External stigma and BASS model (R^2= .64)				
External stigma	-.004	.004	[-.013, .005]	-.96
Self-compassion	-.044***	.006	[-.056, -.032]	-7.01
External stigma and self-compassion	.0001	.0001	[-.0002,.0004]	.81

Self-compassion = FSCRS-SF, Internal stigma = WSSQ, External stigma = SSI-B, AE, AO, BASS, SCW, OP= MBSRQ-AS, ACE's = ACE Q. *p = < .05, ** p = < .01, *** p = < .001

2.4.3.2 Weight

Self-reporting a higher weight was moderately associated with less self-compassion, more experiences of external weight stigma, poorer body image as measured by the AE and the BASS subscales, and less appearance orientation as measured by the AO subscale. There were no significant associations found between internal weight stigma and current weight. There were also no significant relationships found between EWL and weight stigma, body image, or self-compassion (See Table 4) Therefore, the planned moderation analysis was not carried out.

2.4.4 Mediation analysis

To test the hypothesis that the relationship between internal/external stigma and body image satisfaction (AE/BASS) would be mediated by appearance orientation (as measured by the AO scale) we planned to carry out a mediation analysis. Based on the Baron and Kenny (1986) model, for a mediation analysis to be appropriate, internal/external weight stigma must be significantly related to the mediator AO; the independent variable internal/external weight stigma must be significantly related to the dependent variable BASS/AE; the mediator (AO) must be significantly related to the dependent variable BASS/AE; and the relationship between the independent variable internal/external weight stigma and the dependent variable BASS/AE must be reduced when the mediator AO is included in the regression. Because there were no significant associations between AO and the other variables (see Table 4) a mediation analysis was not carried out.

2.4.5 Anxiety and Depression Pre- Post-Surgery

A paired samples t-test was carried out to investigate changes in levels of anxiety and depression from baseline (pre-surgery) to post-surgery as measured by the GAD-7 and PHQ-9. There were no significant differences found for anxiety pre-surgery (M = 7.57, SD = 8.03) compared to post-surgery (M = 10.14, SD = 5.93), $t(20) = -1.57$, $p = .066$. There were no significant decreases in depression scores from pre-surgery (M = 9.67, SD = 7.61) compared to post-surgery either (M = 10.31, SD = 7.61), $t(20) = .359$, $p = .362$). At a bivariate level, self-compassion was not significantly related to change in anxiety ($r = -.30$, $p = .182$) or depression $r = .28$, $p = .220$) from pre to post surgery.

2.5 Discussion

This study aimed to investigate the associations between both internal and external experiences of weight stigma, body image and EWL post-bariatric surgery in a sample of NHS patients. We were interested in whether self-compassion moderated these associations by acting as a buffer against the association between stigma and poor body image and EWL post-surgery. Overall, it appeared that self-compassion was associated with better body image at all levels of stigma, and self-compassion did moderate the relationship between internal stigma and body image appearance evaluation after bariatric surgery. Participants with higher levels of self-compassion experienced poorer body image only if they had higher levels of internalised stigma, whereas for participants with low levels of self-compassion body image was poor irrespective of level of internal stigma.

In support of our first hypothesis, we found that experiences of both internal and external weight stigma were positively associated with poorer body image following bariatric surgery. This is in line with previous research which has shown associations between weight stigma and body image disturbances in obese populations (Carels et al., 2010; Durso & latner, 2008; Friedman et al., 2005; Friedman et al., 2008; Latner et al., 2009). Both internal and external stigma were also associated with lower self-compassion which is also consistent with previous research by Forbes & Donovan (2019) and Lamont and Deines (2023). We also found that having higher levels of self-compassion was associated with better body image which again is in line with earlier research (Braun et al., 2016; Rahimi-Ardabili et al., 2018). Being kind and non-judgemental to oneself is non-congruent with the negative appraisals one might experience with poor body image (Neff, 2004) and it is suggested that those who are more compassionate to themselves are more accepting of their bodies (Berry et al., 2010).

In support of our next hypothesis, we found that the relationship between internal stigma and how positively participants evaluated their overall appearance on the AE subscale was in

fact significantly moderated by self-compassion. Participants with above average self-compassion reported more positive appearance evaluation. This is in support of previous research which found self-compassion to act as a buffer in this way (Hilbert et al., 2015; Wong et al., 2019). This has been explained to be because self-compassion is not congruent with the negative inner cognitions of internal weight stigma or poor body-image (Durso & Latner, 2008). Furthermore, self-compassionate individuals are more self-accepting (Akin 2008), more resilient (Brion et al., 2014), and have better coping responses (Sbarra et al., 2012). Thus, they may be more able to cope with and accept the difficult circumstances that may present after surgery. It is important to highlight that the interaction accounted for a very small proportion of the model variance, and statistical significance was only just reached. Further research with a larger sample is warranted to see whether these results would be replicated.

More specifically however, our findings showed that self-compassion was most helpful for those with low internalised stigma. The finding is surprising as we had thought that that stigma would negatively impact body image in most groups and this relationship would be weakened if participants were more self-compassionate. However, the results actually seem to suggest that once self-compassion is added to the model stigma does not have a strong effect on body image satisfaction. The exception was the more self-compassionate participants, whose appearance evaluations were related to how much internalised stigma they experienced. In fact, the only participants with body image AE average scores higher than 'neutral' were those with high levels of SC who had not internalised much weight stigma. A previous study with participants with overweight/obesity found that a brief self-compassion intervention improved participants body image, increased their self-compassion and reduced their internal weight stigma (Forbes et al., 2020). They did not investigate the mechanisms underlying these effects however results from our study could suggest that it was the increase in self-

compassion combined with the reduction in weight self-stigma which led to the significant improvements in body-image. Further research into the underlying mechanisms of change is warranted in this area for example, using a mediator model. We did not explore this as we wished to stick to our a priori moderator hypothesis thus lowering the risk of finding false positive results (Type I errors).

Interestingly, for those with average or low self-compassion, the association between internalised stigma and dissatisfaction with overall body image was weaker. Body image appeared to be equally poor regardless of the amount of stigma participants had internalised. This could be thought about in evolutionary terms considering that compassion theory posits that those who are unable to foster the ability to be compassionate to themselves early on, are likely to be predisposed to higher levels of shame, guilt, and self-criticism thus leading to a more ingrained dissatisfaction with body image (Gilbert, 2014) that is not related to levels of internal weight stigma but persists regardless of this. This could implicate levels of self-compassion as a causal factor in this case rather than a moderator or mediator as has been found in other research. This effect was still significant when controlling for ACE's which have been linked to obesity (Wiss & Brewerton, 2020) and suggested to be a confounding factor in weight stigma research (Braun et al., 2020;2022) and have been associated with higher levels of stigma (Schulte et al., 2021). This indicates that the results we found were not influenced by participants experiences of ACE's.

Interestingly, although self-compassion reduced the impact of *external* stigma on AE this effect was additive. The impact of self-compassion was similar at all levels of external stigma and therefore the moderator effect seen for internal stigma was not replicated, although visually the pattern of results looked similar when graphed, it was not significant (see figure 3). Although external weight stigma has been associated with internalised stigma in previous

research, which has highlighted that the construct may mediate the relationship between external experiences of stigma and other variables (Durso et al., 2012; Forbes & Donovan, 2019; Pearl et al., 2015), it is still known to be a distinct construct to internalised stigma (Decker et al., 2018). For example, in research looking at other types of stigma, it has been illustrated that these two types of stigma often have different outcomes and function distinctly. This is possibly because internalised stigma is said to develop not only from explicit experiences of stigma, but also from perception of stigma or exposure to the media (Corrigan et al., 2009; Krajewski et al., 2013). It is likely that it is one's internalisation of and interpretation of stigmatising experiences that lead to the distress experienced rather that the experience itself (Durso & Later, 2008). Thus, it could be that self-compassion is helpful irrespective of levels of external stigma, however if people have high levels of internalised stigma, self-compassion has less of an effect.

In our sample participants reported on average having experienced a stigmatising experience at least once a year. This is higher than has been reported in previous research in similar populations using the same measure who reported that participants had experienced stigmatising events about once to several times in their lifetimes. (Ashmore et al., 2008; Puhl & Brownell, 2008). In contrast, studies where respondents kept a daily diary of stigmatising events as they occurred, reported an average much higher (Seacat et al., 2016; Vartanian et al.,2016). There are well-known problems with retrospective self-report measures in that accurate recall is said to deteriorate over time (Ekholm, 2004; Gmel & Daeppen, 2007) and experiences tend to be underreported. This is interesting due to the relatively high mean in this study. One possible explanation for this could be self-selection bias. Participants were aware of the nature of the study and thus those who chose to take part may have been those that had experienced more stigmatising experiences.

Interestingly results were not replicated with the body image BASS subscale. Although self-compassion improved BASS, there was no effect of internal or external stigma or moderation effect. This is unexpected as the BASS and the AE subscales are both said to measure overall satisfaction with body image (Cash, 2015) and were highly correlated. It could be argued that the BASS subscale requires a more objective rating of satisfaction with individual body parts whereas the AE subscale asks how much respondents agree with statements such as "I am sexually appealing" and "Most people would consider me good-looking" which seem to be tapping into how they see themselves in the eyes of others, and thus may be more directly related to experience of stigma. Given the proposed links between the body image of individuals with obesity and body dysmorphia (Larkin et al., 2017) and the tendency to become preoccupied with individual body parts and have distorted views of them (Veale, 2010) it could be that there is a mechanism here relating to this subscale that is leading to different effects. These are possible explanations for the difference in findings between the AE subscale and the BASS however further investigation is warranted. This includes the development of more specific outcome measures that do take into account important factors like excess skin and body dysmorphia to help us understand the complexity of body image after bariatric surgery.

Although some research has indicated that significant weight loss is associated with improvements in body image (Adami et al., 1994; Stunkard & Wadden,1992) this is not always the case as it has also been shown that individuals who were formally obese score similarly to individuals with obesity on measures of body image (Cash et al., 1990). A previous study with a bariatric population did however find EWL to be significantly associated with improvements in the body image evaluation (AE) scale after surgery (Dixon et al., 2002). Our results did not find EWL to be significantly associated with improvements in either the AE or BASS subscales. This could be because of the smaller sample size of patients with EWL

data meaning this was underpowered to find significance. Or given the mixed findings from previous research it could be that weight loss does not necessarily improve body image reliably. Research has shown that individuals who lose weight often still see themselves as a larger person in a thin body (Alegria & Larsen, 2015). Schema theory (Fiske & Taylor, 1991), or more specifically self-schema is one way to frame this phenomenon. Self-schemas are views that individuals hold about themselves based on pertinent characteristics. These can be difficult to alter (Smith, 1998) however events such as significant weight loss can disrupt these self-views and it can take time to reconstruct them again (Alegria & Larsen, 2015). This often leaves people unable to view themselves as they really are. A phenomenon which has also been linked to body dysmorphic disorder (Larkin et al., 2017). Furthermore, excess skin has also been found to cause significant problems with body image following surgery (Alegria & Larsen, 2015) thus further research investigating some of these variables with a larger sample size is warranted.

We hypothesised that the more body image-oriented participants were, as measured by the AO, the stronger the relationship would be between stigma and body image dissatisfaction. In contrast to previous research, AO was not related to levels of stigma (Pearl et al., 2020) or self-compassion (Homan & Tylka, 2015) and thus we were unable to carry out further mediation analysis. Compared to norms for a sample of individuals with obesity (Cash, 1993) and a group of post-bariatric surgery patients (Song et al., 2016) our mean score for the AO subscale were similar. At a bivariate level we did find a weak relationship between current weight and AO in that the less participants weighed, the higher their scores on the AO. This is in line with previous research which found the heavier participants were, the less appearance orientated they were (Dixon et al., 2002; Quittkat et al., 2019). It has been suggested that this could be a coping mechanism to protect individuals from psychological distress by avoiding paying too much attention to their appearance (Myers & Rosen, 1999). Again, it would be

interesting to investigate whether excess skin would play a similar role as weight in reducing one's appearance orientation.

Regarding mood after surgery, as expected, lower anxiety and depression scores did correlate with higher self-compassion highlighting the already well-known benefits of self-compassion on these psychological constructs. It was also noted that lower anxiety and depression was also related to (Wilson et al., 2019), better body-image (Rahimi-Ardabili et al., 2018) and lower levels of both internal and external stigma (Forbes et al., 2020) We predicted that anxiety and depression would be significantly lower following surgery and that this difference would be greater for those that were more self-compassionate. In contrast to previous findings by Gill et al. (2015) in their systematic review, this hypothesis was not supported and there were no differences found pre-post-surgery in our sample. This is supported by other research which found that anxiety and depression reduced up two years post-surgery but then began to increase again up to five years post (Ribeiro et al.,2018). Given that our study included patients up to five years post-surgery this could support these findings and the transient nature of mental health improvements after surgery. An alternative perspective could be that bariatric patients may underreport their mental health difficulties due to fear that they might not get accepted for surgery (Burgmer et al., 2007; Fabricatore et al.,2006) and thus their post-surgery scores are a more accurate representation of their mental health than their pre scores.

2.5.1 Limitations and Future Research

Although this study contributes evidence of the benefits of self-compassion in post-bariatric patients, there are some limitations that are important to note. This study relied on self-report measures, used a cross-sectional design, and had an unrepresentative sample. The cross-sectional design of this study means that we cannot establish the direction of causation

between the variables and more longitudinal and or experimental research is required for causal inferences to be made between weight stigma, body image and self-compassion. For example, research that manipulates levels of stigma or self-compassion could be helpful. Self-report measures have been shown to be at risk of various biases. In relation to self-reporting of retrospective experiences of stigma, there may be underreporting due to difficulty and bias in this type of recall (Bradburn et al., 1987). The recruitment strategy may have also been subject to bias as all eligible individuals were invited to take part however only 17% percent completed. This means that the sample may have been affected by self-selection bias (Heckman, 1990).

Finally, the sample consisted of mainly white middle-aged females. Although this may be representative of those who present for a weight loss intervention (Crane et al., 2017), it is not likely generalisable to the broader population of individuals with obesity and thus we cannot infer whether these results would still be significant in more diverse groups. Further research should be carried out with men and with people from different cultural backgrounds. Furthermore, this study did not investigate whether participants had taken part in a psychological intervention prior to surgery. It would also be interesting to explore this in future research to see whether having, for example, a self-compassion intervention prior to surgery, would yield similar findings, thus allowing more inference of causation. This study also did not gather data on the excess skin of participants so it is not possible to know where our population were in regard to this, however, future research could investigate whether these associations are influenced by the amount of excess skin an individual has.

In conclusion, this study broadens existing evidence that being self-compassionate is likely to lead to better body image satisfaction and less weight self-stigma in a sample of post-bariatric surgery patients. It also suggests that self-compassion may buffer against the negative

effects of internalised weight stigma on body image. However, it seems that this may be particularly helpful for enhancing the body image appearance evaluation of individuals with lower levels of internalised stigma. These findings are important clinically, as currently there is no definitive psychological pathway within the NHS for bariatric surgery candidates. This study supports previous findings in similar populations (Braun et al., 2016; Forbes et al., 2020; Haley et al., 2022; Rahimi-Ardabili et al., 2018) that helping patients to increase their self-compassion is likely to have a positive effect on their body-image and lessen some of the negative sequelae of weight stigma. This has important implications in the post-bariatric population given that surgery doesn't always improve body image (Busetto et al., 2018) and there are high rates of weight regain (Brissman et al., 2021) and excess skin after surgery. This can then lead to worsening mental health and/or disordered eating which is then likely to lead to the surgery being less successful (Bailot et al., 2017; Ramalho et al., 2015). Overall, targeting self-compassion appears to be a promising way to help patients to respond to themselves with kindness and acceptance of their appearance (Neff, 2004) after surgery despite complicating factors such as poor body image, weight stigma and excess skin, although it seems those with the highest levels of internalised stigma may also need other psychological help, perhaps to address the stigma more directly. Research in similar populations using self-compassion interventions (Forbes et al., 2020) and interventions with a significant self-compassion component (Palmeira et al., 2017;2019) is promising. A number of studies report not only improvements in self-compassion, but reductions in internal weight stigma which, given the finding in this study that self-compassion was most helpful in improving body image for those with less weight-stigma, interventions with components such as self-compassion that appear to impact both constructs together, may lead better longer term outcomes and the best improvements in body image satisfaction post-surgery.

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Appendix A Search strategy

The titles and abstracts will be searched for the following keywords and phrases:

obes* OR overweight OR “excess weight” OR high-BMI OR "high BMI" OR “high body mass index” OR “BMI OR weight OR bariatric

3rd-wave OR "third wave" OR third-wave OR CFT OR ACT OR DBT OR CMT OR Mindful* OR "compassion* mind training" OR "Compassion focused therapy" OR compassion OR "acceptance and commitment therapy” OR “dialectical behavio* therapy” OR “Functional Analytic Psychotherapy” OR FAP OR “Meta Cognitive Therapy” OR MCT OR “Mindfulness Based Stress Reduction” OR MBSR OR “Mindfulness Based Cognitive Therapy” OR MBCT OR “Mindfulness based relapse prevention” OR MBRP OR “Mindfulness Based Eating Awareness Training” OR MB-EAT OR “Cognitive Behavio* Analysis System of Psychotherapy” OR CBASP OR “Schema Therapy”

Body-image OR "body image" OR "body satisfaction" OR "body dissatisfaction" OR "body uneasiness" OR stigma OR self-stigma OR "self stigma" OR "internal* stigma" internal*-stigma OR "weight stigma" OR “weight bias” OR weight-bias

Subject headings will also be searched using the following terms:

Obesity

Cognitive behavioural therapy

Body-image

Stigma

Appendix B Quality Ratings of Included Studies

Questions	Levin et al. (2018)	Lillis et al. (2009)	Pearson et al., (2012)	Potts, (2018)	Potts et al., (2022)	Weineland et al., (2011).	Weineland et al., (2012)	Palmeira et al., (2017)	Palmeira et al., (2019)	Forbes et al., (2020)	Haley et al., (2022)	Bahadori et al., 2022
1. Was the research question clearly stated?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2. Was the selection of study subjects free from bias?	Y	Y	UC	Y	Y	Y	Y	Y	Y	Y	Y	Y
3. Were study groups comparable?	NA	Y	UC	Y	Y	Y	Y	Y	Y	N/A	N/A	Y
4. Was method of handling withdrawals described?	UC	Y	Y	Y	UC	N	N	Y	Y	Y	UC	N/A
5. Was blinding used to prevent introduction of bias?	N	Y	N	N	N	N	N	Y	Y	N	N	UC

Questions	Levin et al. (2018)	Lillis et al. (2009)	Pearson et al., (2012)	Potts, (2018)	Potts et al., (2022)	Weineland et al., (2011).	Weineland et al., (2012)	Palmeira et al., (2017)	Palmeira et al., (2019)	Forbes et al., (2020)	Haley et al., (2022)	Bahadori et al., 2022
	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
6. Were intervention/exposure factor or procedure and any comparison(s) described in detail? Were intervening factors described?												
	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7. Were outcomes clearly defined and the measurements valid and reliable?												
8. Was the statistical analysis appropriate for the study design and type of outcome indicators?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9. Were conclusions supported by results with biases and limitations taken into consideration?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Questions	Levin et al. (2018)	Lillis et al. (2009)	Pearson et al., (2012)	Potts, (2018)	Potts et al., (2022)	Weineland et al., (2011).	Weineland et al., (2012)	Palmeira et al., (2017)	Palmeira et al., (2019)	Forbes et al., (2020)	Haley et al., (2022)	Bahadori et al., 2022
10. Is bias due to study's funding or sponsorship unlikely?	UC	Y	UC	UC	Y	UC	UC	Y	Y	UC	Y	Y
Rating	+	+	Ø	+	+	+	+	+	+	+	+	Ø

MINUS/NEGATIVE (-)
If most (six or more) of the answers to the above validity questions are "No," the report should be designated with a minus (-) symbol on the Evidence Worksheet.
NEUTRAL (Ø)
If the answers to validity criteria questions 2, 3, 6, and 7 are "Yes" but several other criteria indicate study weaknesses, the report should be designated with a neutral (Ø) *symbol on the Evidence Worksheet.*
PLUS/POSITIVE (+)
If most (six or more) of the answers to the above validity questions are "Yes" (including criteria 2, 3, 6, 7), the report should be designated with a plus symbol (+) on the Evidence Worksheet.
When a validity criteria question is NA
If any of the ten validity questions are NA, the report requires a majority of "Yes" answers (including 2, 3, 6, 7, as applicable) for a plus (+), or a majority or "No" answers for a minus (-) rating.

Appendix C ERGO and HRA ethical approval

70127.A1 - The relationship between stigma and body image post bariatric surgery and the role of self-compassion (Amendment 1)

Submission Overview | Submission Questionnaire | Attachments | History

Details

Status Approved
Category Category A*
Submitter's Faculty Faculty of Environmental and Life Sciences (FELS)

The end date for this study is currently 01 October 2023

Request extension

If you are making any other changes to your study please create an amendment using the button below.

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Miss Stephanie J Ennis
Trainee Clinical Psychologist
University of Southampton
Psychology, Faculty of Environmental and Life Sciences
Highfield Campus
University of Southampton
SO17 1BJ

Email: approvals@hra.nhs.uk
HCRW.approvals@wales.nhs.uk

08 September 2022

Dear Miss Ennis

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**The relationship between stigma and body image post bariatric surgery and the role of self-compassion.**
IRAS project ID:	**311099**
Protocol number:	**v.01**
REC reference:	**22/PR/0873**
Sponsor	**University of Southampton**

I am pleased to confirm that HRA and Health and Care Research Wales (HCRW) Approval has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Appendix D Qualtrics survey including participant information sheet (PIS), consent form and de-brief sheet

The relationship between stigma and body image post bariatric surgery the role of self-compassion

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Start of Block: Default Question Block

Participant Information Sheet

Study Title: The relationship between stigma and body image post bariatric surgery and the role of self-compassion.

Researchers: Stephanie Ennis, Dr Catherine Brignell and Dr Lisa Cant

University e-mail: se2n20@soton.ac.uk

ERGO/IRAS number: 70127/311099

Version and date: V3.0 25.8.22

You are being invited to take part in the above research study. To help you decide whether you would like to take part or not, it is important that you understand why the research is being carried out and what it will involve. Please read the information carefully before deciding to take part in this research. You may discuss it with others, but it is your decision whether or not you would like to take part. If you would like to ask any questions or discuss the study further before deciding, then you can contact the lead researcher on se2n20@soton.ac.uk. You may take as long as you like to decide if you would like to take part and you may discuss this study with other people if you wish. You can come back to

this link at any point in the future when you are ready to take part.If after reading this sheet you are happy to participate you will be asked to give consent on the next page.

What is the research about? My name is Stephanie Ennis and I am a Trainee Clinical Psychologist studying on the Doctorate course at the University of Southampton in the United Kingdom. I have previously worked in a bariatric service prior to training, and I am passionate about furthering research in this area. I am inviting you to take part in a study investigating the effects of weight-related stigma on outcomes from bariatric surgery. Stigma may be described as negative attitudes or discrimination against someone based on a particular characteristic that someone may think is different to themselves. This study is also interested in whether self-compassion (the ability to be kind and understanding to oneself during difficult times) may have a positive impact upon this. Research has shown that experiences of stigma are often associated with people feeling unhappy with their body image. The ability to be self-compassionate has been found to lessen some of these negative effects of stigma. This study aims to investigate the relationship between experiences of stigma and how happy people are with their body image after bariatric surgery. The study also wishes to investigate the relationship between experiences of stigma and weight loss after bariatric surgery. Additionally, the study aims to investigate how mental health before bariatric surgery compares with mental health after bariatric surgery and what impact difficult life events might have on our findings. The hope is that this research may help provide evidence for self-compassion as a potential psychological treatment that may help people get the best outcomes from surgery.

The study was approved by the Faculty Research Ethics Committee (FREC) at the University of Southampton (Ethics/ERGO Number: 70127/311099

What will happen if I take part? This study involves completing an online set of questionnaires which should take approximately no more than 60 minutes of your time.

If after reading this sheet you decide you would like to take part, then there are three ways in which you can do so:

To take part online please click to continue at the bottom of this page and you will then be asked to provide your consent. Contact the researcher on se2n20@soton.ac.uk to be sent a paper version of the questionnaire pack, or to request to go through the

questionnaires together over the phone or via videocall. When received please return the consent form in the pre-paid envelope at your earliest convenience.

Your safety will be the most important thing so only the dedicated research team will have access to the answers you provide in this survey. The answers you give to the following questions will be stored electronically on a secure university server. Once you have completed the questionnaires your part in the research will be finished.

Do I have to take part? No you do not have to take part. If after reading this you decide you don't want to take part, please simply exit the survey. This will not in any way affect your legal rights to access treatment or your access to routine care for your condition.

Why have I been asked to participate? You have been asked to take part because you are over 18 and have had a bariatric surgery procedure within the last five years. You must not be currently waiting for revisional surgery, and you must be able to read and speak English. I am aiming to recruit around 150 participants for the study.

What information will be collected? The questions in this survey ask for information relating to your experiences of weight related stigma, your current body image satisfaction, self-compassion, adverse early life events and current mental health including anxiety and depression. Demographic information will also be requested relating to your age, gender, ethnicity, and employment status.

We will also ask whether you give consent for the researcher from The University of Southampton to access your NHS bariatric record to gather your weight loss post-surgery and some scores related to your mental health pre-surgery. If you consent to this we will ask you for two of the following pieces of information: name, date of birth or hospital and/or NHS number.We are also interested in where you had your bariatric surgery, which type of surgery you have undergone and whether you have had more than one surgery operation.

Please try to answer all of the questions asked wherever possible however if any questions feel too difficult you are free to leave them blank.

What are the benefits of taking part? By taking part you will be contributing to the

knowledge in this important area of research which is currently limited. The hope is that this research may help provide evidence for psychological treatments that may help people before and after bariatric surgery to get the best outcomes. As a token of appreciation on completion of the questionnaires, you will be sent a £5 Amazon e-voucher to an email address that you provide.

Are there any risks involved? Due to the nature of some of the questions you will be asked there is the possibility that taking part in this study could cause you some psychological discomfort and/or distress. For example some of the questions ask about experiences of childhood abuse, other questions ask about anxiety and depression and others ask about your experiences of weight related stigma. If at any point you do feel distressed, you can contact the following resources for support. The website below has an up-to-date list of NHS recommended support lines.

Mental health - NHS (www.nhs.uk)

If for any reason you are struggling and you need further support with your mental health but it is not an emergency, you can call 111 or arrange to see your GP who can signpost you to local services. If you have immediate concerns about your mental health or are at risk of harming yourself, call 999 or attend your nearest A&E department. Should you feel uncomfortable you can leave the survey/ stop taking part at any time.

What will happen to the information that is collected? Your participation and the information we collect about you during the course of the research will be kept strictly confidential. Only members of the research team and responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Questionnaires and one copy of your consent form will be kept by the researcher and stored in a locked filing cabinet only accessible by members of the direct research team. Another copy will be kept securely in your medical records. Your questionnaire data and

your consent form and any identifiable information will be stored separately. Any identifiable information you may choose to give us such as name, DOB, NHS number or hospital number will be deleted as soon as it has been linked to your questionnaire data and an anonymous ID code will be used.

All participants who take part in the trial will be given this code as soon as reasonably possible and that code, rather than your name, will be used to identify you in the analysis and write up of the study. In addition, all data will be pooled and only compiled into data summaries or summary reports. Only the researcher and their supervisors will have access to this information. The information collected will be analysed and written up as part of the researcher's dissertation. The research team also aims to publish the study and its findings in a peer reviewed journal and present it at conferences. The University of Southampton conducts research to the highest standards of ethics and research integrity. In accordance with our Research Data Management Policy, data with personal details (including consent forms) will be deleted/destroyed after the study period and write-up has been completed (maximum three years after study ends). Anonymised data will be archived in ePrints following study completion.

What happens if I change my mind? If, at any time, you decide that you no longer wish to proceed with this research you have the right to withdraw from the trial and have your data removed up to 4 weeks after taking part. This will not in any way affect your legal rights to access treatment or your access to routine care for your condition.

What happens if there is a problem? If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions. Please do contact us via the e-mails below.

Lead researcher: Stephanie Ennis- se2n20@soton.ac.uk
Primary supervisor: Dr Catherine Brignell- c.brignell@soton.ac.uk
Secondary supervisor: Dr Lisa Cant – l.a.cant@soton.ac.uk

The University of Southampton is the sponsor of this research, and the study is covered by professional Indemnity and Clinical Trials Insurance. If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton

Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk). Please quote the Ethics/ERGO number above.

More information on your rights as a study participant is available via this link: https://www.southampton.ac.uk/about/governance/participant-information.page

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you. Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it. Your data will be anonymised as soon as reasonably possible using a code so that data can be linked. This means that the data that allows identification still exists but it is kept securely and separately from the main dataset.

This is so it can be traced and deleted if you decide you no longer wish to take part in the study. You can request to have your data deleted up to four weeks after taking part. Only the principal researchers will have access to this data.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose. For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. Personal data will be kept only for as long as necessary (see http://library.soton.ac.uk/researchdata/storage). Therefore, data with personal details (including questionnaires/consent forms) will be deleted after the study period and write-up has been completed (maximum three years after study ends). In line with the University of Southampton Open Access Policy, anonymised data will be archived in ePrints following study completion. To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect. If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you for reading this information sheet and considering taking part in this research. If you feel happy to take part and you have had chance to ask any questions please click the arrow to continue where you will be asked to provide your consent.

Page Break

Q2 *(Please print screen/screenshot the following consent pages if you would like a copy for your records)*

I confirm that I have read the information sheet on the previous page dated 25.8.22 (version 3.0) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

- ○ Yes
- ○ No

Skip To: End of Block If (Please print screen/screenshot the following consent pages if you would like a copy for your rec... = No

Q3 Do you agree to take part in this research project and agree for my data to be used for the purpose of this study

- ○ Yes
- ○ No

Skip To: End of Block If Do you agree to take part in this research project and agree for my data to be used for the purpo... = No

Q4 I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.

- ○ Yes
- ○ No

Skip To: End of Block If I understand that my participation is voluntary and that I am free to withdraw at any time withou... = No

Q5 I understand that I am able to withdraw my data from the study up to 4 weeks after taking part. After which it will not be possible to withdraw the data

- ○ Yes
- ○ No

Skip To: End of Block If I understand that I am able to withdraw my data from the study up to 4 weeks after taking part. A... = No

Q6 I agree for my anonymised data to be re-used in future research as part of the Open Access policy

- ○ Yes
- ○ No

Skip To: End of Block If I agree for my anonymised data to be re-used in future research as part of the Open Access policy = No

Q7 I understand that relevant sections of my bariatric record and data collected during the study may be looked at by individuals from The University of Southampton, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records

- ○ Yes
- ○ No

Skip To: End of Block If I understand that relevant sections of my bariatric record and data collected during the study ma... = No

Q8

Optional (Please print screen/screenshot this page if you would like a copy for your records)

One important part of this study is to find out about your weight loss after bariatric surgery, as this is another indicator of how the surgery went. We are also interested in comparing scores from some questionnaires about your mood, which you filled in before surgery to some of the scores of the questionnaires you have just filled in.

To be able to get this information we (the researchers from the University of Southampton) need at least two pieces of your information (this could be two of either your name, DOB, NHS or hospital number) so that we can find your NHS bariatric service record. The mood questionnaire scores and weight loss information is the only information we will take from your record. We will aim to look at as little of your record as possible to gather this information.

I give consent to provide 2 pieces of my identifiable information (this could be two of either your name, DOB, NHS or hospital number) to enable the research team to access the NHS bariatric service record for the purposes of research as detailed in the Patient

Information Sheet. If you do not consent to this please do not fill in the questions below.

- ○ Yes
- ○ No

Q9 Full name:

_____

Q10 Date of Birth:

_____

Q11 NHS number (Usually found on appointment letters):

_____

Q12 Hospital number (Usually found on appointment letters):

_____

Q13 *Original copy for participant, 1 copy for researcher, 1 copy for medical records. (Please print screen/screenshot this page if you would like a copy for your records)*

Q14 Over the last 2 weeks, how often have you been bothered by any of the following problems?Please click to indicate your answer

	Not at all (1)	Several days (2)	More than half the days (3)	Nearly every day (4)
Little interest or pleasure in doing things (1)	○	○	○	○
Feeling down, depressed, or hopeless (2)	○	○	○	○
Trouble falling or staying asleep, or sleeping too much (3)	○	○	○	○
Feeling tired or having little energy (4)	○	○	○	○
Poor appetite or overeating (5)	○	○	○	○
Feeling bad about yourself — or that you are a failure or have let yourself or your family down (6)	○	○	○	○
Trouble concentrating on things, such as reading the newspaper or watching television (7)	○	○	○	○
Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual (8)	○	○	○	○

Thoughts that you would be better off dead or of hurting yourself in some way (9)	○	○	○	○

Q15 Over the last 2 weeks, how often have you been bothered by the following problems? Please click to indicate your answer

	Not at all (1)	Several days (2)	More than half the days (3)	Nearly every day (4)
Feeling nervous, anxious, or on edge (1)	○	○	○	○
Not being able to stop or control worrying (2)	○	○	○	○
Worrying too much about different things (3)	○	○	○	○
Trouble relaxing (4)	○	○	○	○
Being so restless that it's hard to sit still (5)	○	○	○	○
Becoming easily annoyed or irritable (6)	○	○	○	○
Feeling afraid as if something awful might happen (7)	○	○	○	○

Q16 When things go wrong in our lives or don’t work out as we hoped, and we feel we could have done better, we sometimes have negative and self-critical thoughts and feelings. These may take the form of feeling worthless, useless or inferior etc. However, people can also try to be supportive of themselves. Below are a series of thoughts and feelings that people sometimes have. Read each statement carefully and click the one that best describes how much each statement is true for you.

	Not at all like me (1)	A little bit like me (2)	Moderately like me (3)	Quite a bit like me (4)	Extremely like me (5)
I am easily disappointed with myself. (1)	○	○	○	○	○
There is a part of me that puts me down. (2)	○	○	○	○	○
I am able to remind myself of positive things about myself. (3)	○	○	○	○	○
I find it difficult to control my anger and frustration at myself. (4)	○	○	○	○	○
I find it easy to forgive myself. (5)	○	○	○	○	○
There is a part of me that feels I am not good enough. (6)	○	○	○	○	○
I still like being me. (7)	○	○	○	○	○
I have become so angry with myself that I want to hurt or injure myself. (8)	○	○	○	○	○
I have a sense of disgust with myself. (9)	○	○	○	○	○

I can still feel lovable and acceptable. (10)	○	○	○	○	○
I stop caring about myself. (11)	○	○	○	○	○
I find it easy to like myself. (12)	○	○	○	○	○
I remember and dwell on my failings. (13)	○	○	○	○	○
I call myself names. (14)	○	○	○	○	○

Q17 Below is a list of situations that people may encounter because of their weight. Please click to indicate whether, and how often on average each of these situations has happened to you. Please rate for the time in your life when this was most significant.

	Never (1)	Once in your life (2)	Several times in your life (3)	About once a year (4)	Several times per year (5)	About once a month (6)	Several times per month (7)	About once a week (8)	Several times per week (9)	Daily (10)
Being singled out as a child by a teacher, school nurse, etc., because of your weight. (1)	○	○	○	○	○	○	○	○	○	○
Being stared at in public (2)	○	○	○	○	○	○	○	○	○	○
Children loudly making comments about your weight to others (3)	○	○	○	○	○	○	○	○	○	○
Having a doctor recommend a diet, even if you did not come in to discuss weight loss (4)	○	○	○	○	○	○	○	○	○	○

Having a romantic partner exploit you, because she or he assumed you were ‘desperate’ and would put up with it (5)	○	○	○	○	○	○	○	○	○	○
Overhearing other people making rude remarks about you in public (6)	○	○	○	○	○	○	○	○	○	○
Not being hired because of your weight, shape or size (7)	○	○	○	○	○	○	○	○	○	○
Having family members feel embarrassed by you or ashamed of you (8)	○	○	○	○	○	○	○	○	○	○

Having people assume you overeat or binge eat because you are overweight (9)										
Being glared at or harassed by bus passengers for taking up ‘too much’ room (10)										

Page Break

Q18 The next set contains questions designed to evaluate how much you fear the judgements of others, as well as what kinds of things your mind has been saying to you about your weight or body shape. Please read each statement carefully and click to choose

between 1 (completely agree with the statement) and 5 (completely disagree with the statement).

	1. Completely agree (1)	2. Somewhat agree (6)	3. Neither agree nor disagree (7)	4. Somewhat disagree (8)	5 Completely disagree (9)
Agree I'll always go back to being overweight. (1)	○	○	○	○	○
I caused my weight problems. (2)	○	○	○	○	○
I feel guilty because of my weight problems. (3)	○	○	○	○	○
I became overweight because I am a weak person. (4)	○	○	○	○	○
I would never have any problems with weight if was stronger (5)	○	○	○	○	○
I don't have enough self-control to maintain a healthy weight. (6)	○	○	○	○	○
I feel insecure about others' opinions of me. (7)	○	○	○	○	○

People discriminate against me because I've had weight problems. (8)	○	○	○	○	○
It's difficult for people who haven't had weight problems to relate to me. (9)	○	○	○	○	○
Others will think I lack self-control because of my weight problems. (10)	○	○	○	○	○
Others are/have been ashamed to be around because of my weight. (11)	○	○	○	○	○
People think I am to blame because of my weight problems (12)	○	○	○	○	○
	1. Completely agree (1)	2. Somewhat agree (6)	3. Neither agree nor disagree (7)	4. Somewhat disagree (8)	5 Completely disagree (9)
Agree I'll always go back to being overweight. (1)	○	○	○	○	○

I caused my weight problems. (2)	○	○	○	○	○
I feel guilty because of my weight problems. (3)	○	○	○	○	○
I became overweight because I am a weak person. (4)	○	○	○	○	○
I would never have any problems with weight if was stronger (5)	○	○	○	○	○
I don’t have enough self-control to maintain a healthy weight. (6)	○	○	○	○	○
I feel insecure about others’ opinions of me. (7)	○	○	○	○	○
People discriminate against me because I’ve had weight problems. (8)	○	○	○	○	○

It’s difficult for people who haven’t had weight problems to relate to me. (9)	○	○	○	○	○
Others will think I lack self-control because of my weight problems. (10)	○	○	○	○	○
Others are/have been ashamed to be around because of my weight. (11)	○	○	○	○	○
People think I am to blame because of my weight problems (12)	○	○	○	○	○

Q19 The following questions contain a series of statements about how people might think, feel, or behave. Please read each statement carefully and decide how much it pertains to you personally right now. Please click to indicate your answer.

	Definitely disagree (1)	Mostly disagree (2)	Neither agree nor disagree (3)	Mostly agree (4)	Definitely agree (5)
Before going out in public, I always notice how I look. (1)	○	○	○	○	○
I am careful to buy clothes that will make me look my best. (2)	○	○	○	○	○
My body is sexually appealing. (3)	○	○	○	○	○
I constantly worry about being or becoming fat. (4)	○	○	○	○	○
I like my looks just the way they are. (5)	○	○	○	○	○
I check my appearance in a mirror whenever I can. (6)	○	○	○	○	○
Before going out, I usually spend a lot of time getting ready. (7)	○	○	○	○	○
I am very conscious of even small changes in my weight. (8)	○	○	○	○	○

Most people would consider me good-looking (9)	○	○	○	○	○
It is important that I always look good. (10)	○	○	○	○	○
I use very few grooming products. (11)	○	○	○	○	○
I like the way I look without my clothes on. (12)	○	○	○	○	○
I am self-conscious if my grooming isn't right (13)	○	○	○	○	○
I usually wear whatever is handy without caring how it looks. (14)	○	○	○	○	○
I like the way my clothes fit me. (15)	○	○	○	○	○
I don't care what people think about my appearance. (16)	○	○	○	○	○

I take special care with my hair grooming. (17)	○	○	○	○	○
I dislike my physique. (18)	○	○	○	○	○
I am physically unattractive. (19)	○	○	○	○	○
I never think about my appearance. (20)	○	○	○	○	○
I am always trying to improve my physical appearance. (21)	○	○	○	○	○
I am on a weight-loss diet. (22)	○	○	○	○	○

Q20 I have tried to lose weight by fasting or going on crash diets.

- ○ Never (1)
- ○ Rarely (2)
- ○ Sometimes (3)
- ○ Often (4)
- ○ Very often (5)

Q21 I think I am:

- ○ Very underweight (1)

- ○ Somewhat underweight (2)
- ○ Normal weight (3)
- ○ Somewhat overweight (4)
- ○ Very overweight (5)

Q22 From looking at me, most other people would think I am:

- ○ Very underweight (1)
- ○ Somewhat underweight (2)
- ○ Normal weight (3)
- ○ Somewhat overweight (4)
- ○ Very overweight (5)

Q23 Use this scale to indicate how dissatisfied or satisfied you are with each of the following areas or aspects of your body. Click to indicate your answer.

	Very dissatisfied (1)	Mostly dissatisfied (2)	Neither satisfied nor dissatisfied (3)	Mostly satisfied (4)	Very satisfied (5)
Face (facial features, complexion) (1)	○	○	○	○	○
Hair (color, thickness, texture) (2)	○	○	○	○	○
Lower torso (buttocks, hips, thighs, legs) (3)	○	○	○	○	○
Mid torso (waist, stomach) (4)	○	○	○	○	○
Upper torso (chest or breasts, shoulders, arms) (5)	○	○	○	○	○
Muscle tone (6)	○	○	○	○	○
Weight (7)	○	○	○	○	○
Height (8)	○	○	○	○	○
Overall appearance (9)	○	○	○	○	○

Page Break

Q24 The following questions ask about difficult experiences you may have had growing up. Please click to indicate your answer.

Prior to your 18th birthday:

	Yes (1)	No (2)
Did a parent or other adult in the household often or very often… Swear at you, insult you, put you down, or humiliate you? or Act in a way that made you afraid that you might be physically hurt? (1)	○	○
Did a parent or other adult in the household often or very often… Push, grab, slap, or throw something at you? or Ever hit you so hard that you had marks or were injured? (2)	○	○
Did an adult or person at least 5 years older than you ever Touch or fondle you or have you touch their body in a sexual way? or Attempt or actually have oral, anal or vaginal intercourse with you? (3)	○	○
Did you often or very often feel that No one in your family loved you or thought you were important or special? or Your family didn't look out for each other, feel close to each other, or support each other? (4)	○	○
Did you often or very often feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? or Your parents were too drunk or high to take care of you or take you to the doctor if you needed it? (5)	○	○
Was a biological parent ever lost to you through divorced, abandonment, or other reason? (6)	○	○

Was your mother or stepmother: Often or very often pushed, grabbed, slapped, or had something thrown at her? or Sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard? or Ever repeatedly hit over at least a few minutes or threatened with a gun or knife? (7)	○	○
Did you live with anyone who was a problem drinker or alcoholic or who used street drugs? (8)	○	○
Was a household member depressed or mentally ill? or Did a household member attempt suicide? (9)	○	○
Did a household member go to prison? (10)	○	○

Q25 **Demographics**

What age group do you belong to?

- ○ 18-24 (1)
- ○ 25-29 (2)
- ○ 30-34 (3)
- ○ 35-39 (4)
- ○ 40-44 (5)
- ○ 45-49 (6)
- ○ 50-54 (7)
- ○ 55 and over (8)

Q26 How would you describe your gender?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer to self describe in another way- Please specify (4)

_____

Q27 What is your ethnicity?

- White British English (1)
- White British Scottish (2)
- White Irish (3)
- Other White (Not specified) (4)
- Indian (5)
- Pakistani (6)
- Bangladeshi (7)
- Other Asian (Not specified) (8)
- White and Asian (9)
- White and Black African (10)
- White and Black Caribbean (11)
- Other Mixed (Not specified) (12)
- African (13)
- Caribbean (14)
- Other Black (Not specified) (15)
- Middle Eastern/North African (16)
- Chinese (17)
- Other Ethnicity (Not specified) (18)

Q28 What is your current employment status?

- ○ Full time employed (1)
- ○ Part time employed (2)
- ○ Self employed (3)
- ○ Out of work and looking for work (4)
- ○ Out of work but not currently looking for work (5)
- ○ Homemaker (6)
- ○ Student (7)
- ○ Military (8)
- ○ Retired (9)
- ○ Unable to work (10)

Q29 **Other questions**

From which NHS hospital were you referred?

- ○ Southmead Hospital (1)
- ○ Royal Bournemouth Hospital (2)
- ○ Queen Alexandra Hospital (3)
- ○ Coventry or Warwick hospitals (4)
- ○ Other (Please state) (5)

_____

Q30 Total number of bariatric surgeries undergone?

- ○ 1 (1)
- ○ 2 (2)
- ○ 3 or more (3)

Q31 What type of bariatric surgery did you have (If more than one please tick the one that matches the most recent surgery)?

- ○ Gastric bypass (Roux-en Y) (1)
- ○ Anastomosis gastric bypass (Mini bypass) (2)
- ○ Sleeve gastrectomy (Gastric sleeve) (3)
- ○ Gastric band (4)
- ○ Biliopancreatic diversion (Duodenal switch) (5)
- ○ Unsure. I give consent for the researcher to find this information in my NHS bariatric record. Please type yes or no in the box below. (6)

_____

Q32
Date of surgery (If more than one please give most recent):

_____

Q33 Current weight:

_____

Q34 As a thank you for taking part we would like to send you a £5 Amazon e-gift card. Please enter the e-mail address that you would like this to be sent to :

_____

Page Break

Q35 **Study Title: The relationship between stigma and body image post bariatric surgery and the role of self-compassion.**

Debriefing Statement : v1.0 25.4.22

ERGO/IRAS number: 70127/311099

The aim of this research is to explore whether experiences of stigma are associated with outcomes from bariatric surgery. Because body image is one of the things people often struggle with after surgery, we decided to focus on body image satisfaction as one of our main outcomes. We are also interested in how weight stigma might affect weight loss after surgery. We then wanted to see whether being self-compassionate may have an impact on the way weight stigma affects these outcomes. Due to the complex nature of bariatric surgery, we know that people can also sometimes struggle with their mental health after surgery. Therefore, we also aimed to see whether weight stigma and self-compassion might have an effect on mental health after surgery.

It is expected that people whose questionnaire scores suggest they have experienced more weight stigma will be less satisfied with their body image and have less overall weight loss after bariatric surgery. We expect weight stigma to have less of an effect in those whose questionnaire scores suggest they are able to be more self-compassionate. As stigma is known to be associated with poor mental health, we expect that people whose questionnaire scores suggest they have experienced less weight stigma to reflect better mental health after bariatric surgery than those with whose questionnaire scores suggest they have experienced more weight stigma.

Your data will help us understand how weight stigma might impact upon outcomes from bariatric surgery. It will help us to see whether being self-compassionate may be a protective factor against the effects of stigma. This may lead to the development and implementation of treatments that could help people get the best outcome from bariatric surgery.

Once again results of this study will not include your name or any other identifying characteristics. This research did not use deception. If you wish you may print yourself a copy of this summary to keep by clicking this link Debriefing statement.doc**.** You may also wish to receive a summary of the research findings once the project is completed, please contact se2n20@soton.ac.uk to register your interest.

If you have any further questions, please contact Stephanie Ennis (Trainee Clinical Psychologist) at se2n20@soton.ac.uk

Thank you for your participation in this research. If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the University of Southampton Head of Research Integrity and Governance (023 8059 5058, rgoinfo@soton.ac.uk).

Support Services

If you are experiencing any distress following participation in this study then please visit the website below for an up to date list of NHS recommended mental health support lines.

https://www.nhs.uk/mental-health/

If for any reason you are struggling and you need further support with your mental health but it is not an emergency, you can call 111 or arrange to see your GP who can signpost you to local services. If you have immediate concerns about your mental health or are at risk of harming yourself, call 999 or attend your nearest A&E department.

End of Block: Default Question Block