UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL, HUMAN AND MATHEMATICAL SCIENCES

School of Psychology

Investigating the impact of compassion based interventions on body image concerns: Can self-compassionate letter writing counteract the impact of thin ideals?

by

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ABSTRACT

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INVESTIGATING THE IMPACT OF COMPASSION BASED INTERVENTIONS ON BODY IMAGE CONCERNS: CAN SELF-COMPASSIONATE LETTER WRITING COUNTERACT THE IMPACT OF THIN IDEALS?

Isabel Florence Lewis

A literature review integrated 24 experimental studies which sought to improve body image through interventions in compassion. Findings across various study designs consistently demonstrated that encouraging participants to be more self-compassionate as well as receiving compassion from others generally led to a reduction in body image concerns as well as eating disorder pathology. Significant increases in self-compassion were not found to coincide with improvements in body image in a large proportion of studies, however. To conclude the review, a number of suggestions for future research are proposed, in order to refine intervention methodologies and clarify how compassion might contribute to promoting healthier body image.

An empirical study examined the impact of a week-long self-compassionate letter writing task on body image concerns, activated by the presentation of thin ideal images. Sixty-two adult females reporting eating disorder symptomology were randomly assigned to the intervention (n = 31) or control (n = 31) groups. All participants were required to complete measures in body satisfaction, body appreciation, thin-ideal internalisation, social appearance comparisons, self-compassion and self-esteem, at baseline and after viewing the thin ideal images. Participants in the intervention group were then trained in the letter writing task, and after practising this for one week were re-assessed in the same measures, alongside the control group. After one week, self-compassionate letter writing significantly improved scores in body satisfaction, body appreciation, thin-ideal internalisation and self-esteem relative to the control group. When presented the second time, the effect of the thin ideals on body satisfaction and body appreciation was significantly less overall, regardless of group. Letter writing interventions may help to enhance self-compassion as well as self-esteem and may in turn help to alleviate body image concerns.

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Academic Thesis: Declaration Of Authorship

I, ... Isabel Lewis

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.

Investigating the impact of compassion based interventions on body image concerns: Can self-compassionate letter writing counteract the impact of thin ideals?

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;
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7. None of this work has been published before submission

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Chapter 1 The impact of compassion based interventions on body image concerns and eating disorder symptomology: A review of the literature

1.1 Introduction

Body dissatisfaction can be defined as having negative thoughts about one's body caused by a perceived discrepancy between one's actual and ideal body shape (Cash & Szymanski, 1995). Body dissatisfaction, particularly in relation to an individual's shape and weight is believed to be one of the most prominent risk factors for the onset and maintenance of all eating disorders (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999), and is markedly prevalent among individuals with normal weight, especially females (Slevec & Tiggemann, 2011). For good reason, a number of lines of research have investigated ways to reduce body dissatisfaction and body image distress in samples of patients diagnosed with eating disorders and individuals at risk. Cognitive behavioural therapy (CBT) is still considered to be the first line treatment for Bulimia Nervosa (BN) and Binge Eating Disorder (BED) and is amongst the recommended interventions for Anorexia Nervosa (AN; NICE, 2017). One major component of these CBT programmes focusses on reducing disturbed body image as one of the core eating disorder psychopathologies (Fairburn & Shafran, 2003). However, a recent meta-analysis (Linardon, Wade et al., 2017) revealed that eating disorder outcomes with CBT were not consistently greater than non-specific supportive therapies when dropout rates and residual symptomology were taken into account. Amongst those who reach recovery status, moderate rates of relapse (18 – 42%) have been documented at follow-up across diagnoses (Carter et al., 2009; Södersten, Bergh, Leon, Brodin & Zandian, 2017; Hilbert, et al., 2012). Relapse can be significantly predicted by enduring physique related concerns at the end of what is often considered to be successful treatment (Fairburn, Peveler, Jones, Hope & Doll, 1993), and so one possibility is that current CBT treatments do not adequately target body dissatisfaction. Treatment efficacy has the potential to significantly improve if interventions were developed which successfully help patients to develop more enduring positive body image. It is possible that incorporating self-compassion into interventions can help to alleviate body dissatisfaction and this has already begun in some national CBT programmes (e.g. Gale,

Gilbert, Read, & Goss, 2014). This literature review is to evaluate the wide range of compassion focused interventions that have been developed to help participants to orient compassion towards themselves and receive compassion from others as a means of improving body dissatisfaction in the context of their shape or weight.

1.1.1 Self-compassion

Self-compassion can be defined as an awareness of personal suffering combined with a commitment to preventing and alleviating this (Gilbert, 2009). From the perspectives of evolutionary psychology, attachment theory and neuroscience, Gilbert (1989) proposed that self-compassion is the primary mechanism behind the soothe system in humans which functions to regulate emotions upon activation of the threat system. This soothing mechanism is believed to initially derive from affiliative relationships with others, whereby infants become acquainted with feeling validated, protected and nurtured by their caregivers and this sense of security helps to appease difficult emotions when their threat system is triggered. As these experiences are internalised, individuals develop the capacity to generate their own sense of safety and comfort to counteract the common psychological side-effects of threat such as fear, shame, insecurity and isolation (Gilbert, 2014). Consequentially, it is believed that an underdeveloped soothe system is less rehearsed in helping an individual to feel emotionally calm and cared for and so individuals are less equipped to manage painful emotions and self-criticism (Gilbert & Irons, 2005).

Self-compassion is hence believed to operate as a means to protect an individual against body dissatisfaction by managing external and internal sources of threats to body image such as social and cultural pressures related to body weight or shape, and self-criticism arising from this (Thøgersen-Ntoumani, Dodos, Chatzisarantis & Ntoumanis, 2017). Several studies have shown support for these ideas with evidence that people high in body dissatisfaction show significantly lower levels of self-compassion compared with those low in body dissatisfaction (e.g. Duarte, Ferreira, Trindade & Pinto-Gouveia, 2015). As well as differences between individuals, there is also support for the notion that natural shifts in self-compassion within individuals are negatively correlated with shifts in state body dissatisfaction (Kelly, Miller & Stephens 2016) as well as the occurrence of maladaptive eating behaviours (Breines, Toole, Tu & Chen). This evidence supports the assertion that self-compassion helps individuals to buffer feelings of inadequacy in response to social pressures related to appearance (Ferreira, Pinto-Gouveia & Duarte, 2013), and encourages them to adopt a caring and nurturing stance towards their bodies.

1.1.2 Previous reviews

Earlier reviews have evaluated the relationship between self-compassion and body image. A recent review by Braun, Park and Gorin (2016) suggested that an inverse relationship between body dissatisfaction and self-compassion can be extrapolated across clinical (patients with eating disorders) and non-clinical samples. They asserted that self-compassion may operate as a protective factor against eating disorder risk factors and outcomes such as body dissatisfaction (Duarte et al., 2015), appearance contingent self-worth (Homan & Tylka, 2015) and body shame (Breines et al., 2014). Other eating disorder associated factors such as obligatory exercise (Magnus et al., 2010; Mosewich et al. 2011), body preoccupation and restrained eating (Wasylkiw, MacKinnon & MacLellan, 2012) were not consistently predicted by levels of self-compassion, however. The review presented further evidence to suggest that higher levels of self-compassion might promote adaptive eating behaviours such as mindful eating (Taylor, Daiss & Krietsch, 2015) and intuitive eating (Schoenefeld & Webb, 2013), as well as positive body image such as body appreciation (Homan & Tylka, 2015), body image flexibility (Kelly, Vimalakanthan & Miller, 2014) but not appearance control beliefs (Daye & Webb, 2014). In this review, Braun et al., (2016) focussed primarily on cross-sectional studies correlating self-compassion with various body variables, and thus it is only possible to speculate about the direction of causation between self-compassion and positive body image when associations were significant. The authors did however include four experimental trials in which participants were trained in self-compassion. In these trials, there was a significant reduction in body dissatisfaction (Albertson, Neff & Dill-Shackleford, 2014) as well as associated maladaptive eating behaviours, such as dieting, binge eating and excessive exercise (Gale et al., 2014). Given their experimental nature, these studies not only provide a more controlled insight into the ways in which self-compassion may protect against or reduce body dissatisfaction but also a clearer view into how to promote self-compassion in vulnerable samples.

In a similar vein, a review by Linardon, Fairburn, Fitzsimmons-Craft, Wilfley & Brennan (2017) indicated that there was reasonable preliminary evidence for the use of third-wave interventions (including compassion oriented therapies) for eating disorders but that more research is required to grant these treatments empirical status. Moreover, a third review (Rahimi-Ardabili, Reynolds, Vartanian, McLeod & Zwar, 2017) recently concluded that self-compassionate interventions can be beneficial for weight loss, nutrition behaviours, eating behaviours and body image, but on the basis of only six clinical trials that were available at the time of writing.

1.1.3 Self-compassion interventions

With this in mind, there is a clear need to examine all of the studies which attempt to induce or cultivate self-compassion for the purpose of improving body image in order to assess the evidence base and pinpoint which interventions are more and less effective. This is especially important in light of the different theoretical models surrounding self-compassion which have given rise to a range of diverse interventions. One major programme, Compassion Focussed Therapy (CFT; Gilbert, 2005), which was developed for individuals high in self-criticism and shame has been piloted in numerous outpatient services. This programme seeks to help individuals to develop their capacity to be self-compassionate, as well as to give and receive compassion from others, in order to realign the evolutionary mechanisms behind the soothe system described by Gilbert (2014). CFT has been applied in the field of eating disorders in a number of trials (e.g. Gale et al., 2014; Pinto-Gouveia et al., 2016).

Alongside CFT, a large proportion of research has also sought to target the three factors encompassed in Neff's (2003) operational definition of self-compassion based on Theravada Buddhism. That is, self-kindness (being understanding towards oneself), mindfulness (being aware of one's distressing thoughts and feelings without amplifying or suppressing these) and common humanity (acknowledging that suffering unites rather than divides human beings). These factors have been incorporated into programmes such as Mindful Self-Compassion (Neff & Germer 2013) which has been adapted for research into body dissatisfaction (e.g. Albertson et al., 2014). This model focusses less on the evolutionary rationale behind self-compassion and more on the importance of accepting negative emotions arising from dissatisfaction around one's body and acknowledging that all humans experience similar painful emotions. One further area of research has focussed on promoting self-compassion in a spiritual context such as through biblical readings (Karpiak & Strategis, 2015) and also Buddhist practices around self-compassion (Braun et al, 2016) including yoga (Braun, Park & Conboy, 2012) and meditation (Seo, 2016). These interventions share some theoretical as well as practical overlap with the aforementioned programmes, but are unique in other ways.

To the author's knowledge, these trials have not yet been reviewed together in the context of body image distress and eating disorder symptomology. The aim of the current review is to examine the literature on psychological interventions that seek to increase self-compassion and compassion for the purpose of reducing body (shape/weight) dissatisfaction. Due to the preliminary nature of this research all studies have been included where samples i) met a clinical diagnosis for

an ED, ii) presented with psychological and/or physical risks associated with body dissatisfaction and the development of an eating disorder (e.g. body image concerns, obesity, dieting), and iii) were not initially screened for poor body image or eating disorder pathology but may have presented in vulnerable groups (e.g. undergraduate females). In order to encompass the full scope of research, all trials which sought to increase self-compassion or the receipt of compassion from others were included, irrespective of their theoretical position. Moreover, all study designs that were amenable to quantitative analysis were included, such as trials with active controls, waitlist control and no control. Overall, the review aims to elucidate the effectiveness of self-compassion interventions in attenuating body shape and weight dissatisfaction, to address gaps and inconsistences in the literature and to identify directions for future research.

1.1.4 Key questions:

I. What are the effects of self-compassion interventions on body image and behaviours associated with this?
II. What is the efficacy of the different methods of delivering these interventions?
III. Which intervention demonstrates the best short and long-term outcomes?

1.2 Method

1.2.1 Search strategies

Systematic searches of the following databases were made from the following databases: PsycINFO, MEDLINE, PsycARTICLES, CINAHL Plus with Full Text, Web of Science Core Collection and ProQuest Dissertations. Table 1 lists the search terms included to identify relevant studies examining the effect of self-compassion interventions on body image. To ensure reliability, two reviewers (the main researcher and another trainee clinical psychologist) independently screened all titles and abstracts. The list of articles which were selected were identical other than four articles which the reviewers jointly discussed to ascertain the final titles for full text review, based on the criteria in Table 2. Reference lists of selected studies were scanned for any additional relevant studies and added accordingly.

Table 1
Search Terms Entered in Databases

	Body dissatisfaction	**Self-compassion**
Search Terms	"eating disorder" OR anorexia OR anorexic OR "eating pathology" OR bulimia OR bulimic OR binge OR "binge eating" OR "restrained eating" OR "rigid restraint" OR "rigid dietary restraint" OR "restrictive diet" OR dieting OR "drive for thinness" OR "thin ideal" OR "body image" OR "body appreciation" OR "body satisfaction" OR "body image distress" OR "body dissatisfaction" OR "weight dissatisfaction" OR "shape dissatisfaction" OR "body disturbance" OR "body image disturbance" OR "body esteem" OR "body preoccupation" OR "shape preoccupation" OR "weight preoccupation" OR "self-objectification" OR "objectified body consciousness" OR "body surveillance" OR "body shame" OR "social physique anxiety" OR "body image avoidance" OR "body image flexibility"	compassion* OR (self-compassion*)

Table 2
Inclusion and exclusion criteria

	Inclusion	**Exclusion**
Participants	• Males and females of any age • Subclinical participants, subjects with an unhealthy BMI (overweight, obese or underweight) and those with a clinical diagnosis of an ED	• Subjects only screened for body dissatisfaction relating to injury, physical illness (e.g. cancer) or surgery (e.g. amputation) • Athlete subjects aspiring to a specific physique which is conceptually distinct from the thin ideal endorsed by Western societies
Study design and publication type	• Randomized controlled trials • Quasi-experimental trials, before-after studies • Non-published trials (to reduce publication bias) • Articles written in or translated clearly into English • Single case studies/case series	• Studies without controlled interventions (e.g. qualitative studies, theoretical articles, systematic reviews, meta-analyses, cross-sectional studies, book extracts, book reviews)

Intervention	• An explicit aim to manipulate levels of self-compassion or the receipt of compassion, for the purpose of improving body-image • Any duration/ setting • Intervention can derive from any theoretical model of self-compassion • Can be used in combination with other interventions (e.g. CBT, mindfulness, nutritional advice)	• Interventions which are considered to involve self-compassion only in retrospect (i.e. the discussion) • Tests for the validity of compassion related scale • Interventions targeting compassion in people supporting individuals with an eating disorder, i.e. family, medical professionals • Unclear description of intervention
Outcomes	• Psychological variables associated with body image in the context of shape/weight (i.e. body satisfaction, body dissatisfaction, body shame, body appreciation, shape/weight over-evaluation) • Behavioural indices associated with body image in the context of shape/weight (body surveillance, intuitive eating, weight loss, physical activity, binge eating)	• Exclusively psychological variables that are not specific to body image (e.g. wellbeing, depression, anxiety) • Exclusively neural correlates of self-compassion • Body dysphoria not pertaining to shape/weight (e.g. following surgery/injury, a physical health condition, ageing, gender dysphoria) • Significance statistics not reported

1.3 Quality Assessment

The Quality assessment tool for quantitative studies (Effective Public Health Practice Project, 1998) uses objective scoring guidelines with accepted validity and reliability properties (Thomas, Ciliska, Dobbins & Micucci, 2004) and so was chosen to evaluate quality for each paper (i.e. weak, moderate, strong), based on selection methods, study design, cofounding variables, blinding, data collection and attrition. Although intervention integrity is not considered to be an essential factor in the quality assessment, the tool recommends factoring this into the overall quality rating. Reporting bias was also examined qualitatively as this is recommended by the Cochrane Collaboration's tool for assessing risk of bias in randomised trials (Higgins et al., 2011) and the Risk Of Bias In Non-randomized Studies of Interventions (ROBINS-I) assessment tool (Sterne et al., 2016).

1.4 Results

On 28th January 2018, the six database searches produced 421 articles, and a further three articles were identified from other sources. After removing 148 duplicates articles and 15 items from books, 261 articles remained. After title and abstract screening, 207 articles were excluded. 48 of these did not focus on body image as one of the primary outcome variables and of those which did focus on body image, 22 were excluded for body distress associated with physical illness, injury or surgery (e.g. cancer, amputation) and five for body dissatisfaction not necessarily pertaining to shape or weight (e.g. ageing, gender dysphoria). 79 were excluded when it was evident that an intervention had not been used to manipulate levels of self-compassion (e.g. cross-sectional studies or no mention of self-compassion in the abstract or title), seven were excluded because they focussed on psychometric assessment and two purely theoretical papers were excluded. Furthermore, two studies examining neurochemical outcomes of self-compassion were excluded, five were excluded for looking at self-compassion in athletes and thirteen for looking at self-compassion in significant others or medical professionals. Seven book reviews were excluded and four review papers as well as twelve qualitative research papers. One additional duplicate was removed that had not been captured in the initial exclusion of duplicate articles. After exclusions, 54 studies remained.

The next stage was full-text verification which left 25 articles describing experimental manipulations of self-compassion which were included. The remaining articles were excluded for not featuring an intervention that attempted to induce self-compassion in subjects or for not describing the intervention in sufficient detail for replication. For a summary of the search process, see the PRISMA flow diagram in Figure 1.

1.4.1 Study characteristics

Table 3 provides summary details of the studies included in the qualitative synthesis. In total there were seventeen randomized controlled trials, three cohort studies, three non-randomized controlled trials and two case studies/series. Study samples ranged from 20 to 518 participants, with ages spanning 14-69 years. Study populations were predominantly female, with twelve trials comprising entirely female participants. Studies were carried out across the globe, with eleven

trials from the US, four from both the UK and Portugal, three from Greece, two from Canada and one from Australia. In nine studies, participants were recruited from clinical settings, and thirteen trials screened participants for a clinical diagnosis of an eating disorder, unhealthy body mass index and/or maladaptive eating behaviours.

The studies measured the influence of self-compassionate interventions on one of the following primary outcomes:

i) eating disorder pathology (n = 9)

ii) body image not within an eating disorder scale (e.g. body dissatisfaction, body shame, body-contingent self-worth, body esteem, weight-self stigma, body appreciation, (n = 11))

iii) body weight/ BMI (n = 11)

iv) Adaptive eating behaviours (e.g. intuitive eating, mindful eating, physical activity (n = 3))

v) Metacognitive variables relating to the body (e.g. cognitive fusion with food cravings, acceptance around weight-related problems, body-image flexibility, (n = 9)).

The variation in study designs and outcome measures was reflected in the range of interventions used, and so studies have been clustered into non-clinical and clinical samples for the purpose of the review. Non-clinical trials provide an indication of the unique impact of specific styles of self-compassion induction (i.e. receiving brief compassionate messages, meditation, diary records, yoga programmes and expressive writing), on various measures of body image. The duration of these interventions ranged from just two minutes to seven months depending on the context of the training. By comparison, trials which were set up for clinical outpatients (receiving treatment for extreme BMIs and/or eating disorders) have presented different combinations of these training elements in group, self-help and one-to-one therapy formats, to explore their influence on clinical outcome measures of eating disorder psychopathology. These interventions lasted anywhere between five and twenty sessions.

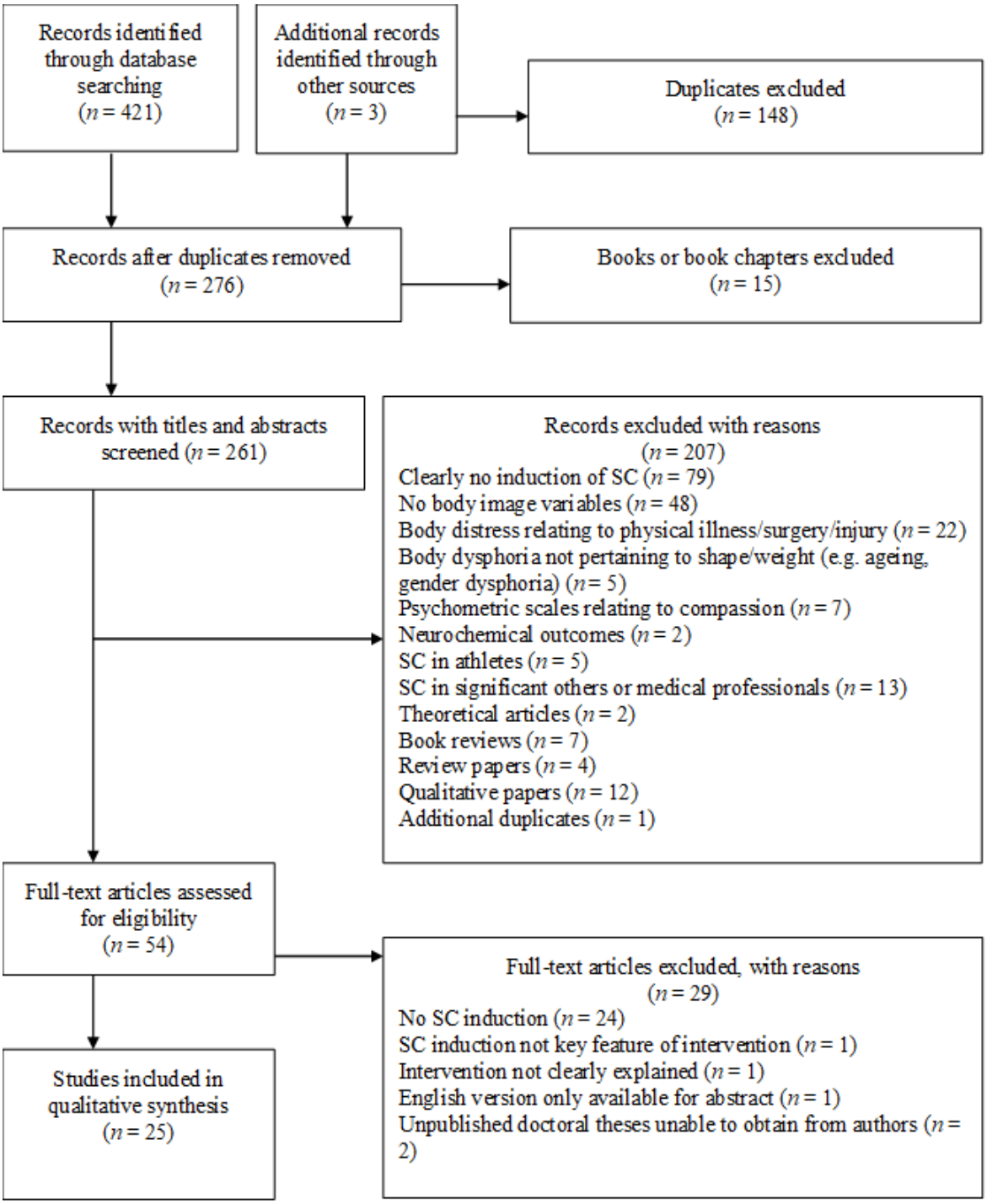


Figure 1. PRISMA (2009) Flow Diagram for records included in the review

Table 3

Compassion interventions for body image and eating disorder pathology

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
1. Adams and Leary (2007)	84	RCT	Compassionate message received by ps after eating doughnut preload, and before candy tasty task, featuring: • CH ("everyone in this study eats this stuff") • SK ("I hope you won't be hard on yourself") • M ("a little amount of food doesn't really matter anyway").	1 x experimental control: After eating doughnut preload, ps asked to complete candy tasting task with no compassionate message 1 x baseline control: Ps asked to complete candy tasting task without doughnut preload	Undergraduate students in US (31% reported currently being on a diet) recruited in exchange for course credits 100% female Mean BMI: 23.1 (17.8 - 41.1)	One afternoon No follow up	• Revised Rigid Restraint Scale • Questions assessing ps reactions to diet–breaking and feelings about eating during experiment • Six items assessing self–compassionate responses to diet–breaking	Significantly higher self–compassionate eating attitudes in the intervention group than the experimental control (p = .03) Significant association between restrictive eating and eating more candy in the baseline control (p = .02) and experimental control groups (p = .03), but not the intervention (p = .40) group.
2. Albertson, Neff and Dill-Shackleford (2014)	228	RCT	Meditation podcasts from Mindful Self-compassion programme: • Compassionate Body Scan • Affectionate Breathing • Loving kindness meditation which evokes an image of someone who has been unconditionally kind to the listener, to generate feelings of goodwill and kindness to self and others.	No meditations	Adults from US with body image concerns recruited online 100% female 18 – 60 years	20 minutes every day for three weeks 3-month follow-up	• BSQ • Body Shame subscale of the Objectified Body Consciousness Scale • BAS • CSW Appearance Subscale • SCS	Significant interaction for Time x Group in: • Self-compassion *(p <.001)* • Body dissatisfaction *(p <.001)* • Body shame *(p < .001)* • Body appreciation *(p < .001)* • CSW–appearance *(p < .01)* For the intervention group, difference between pre-test and FU was significant (p < 0.5), but not post-test and FU (p > 0.5).
3. Altman, Zimmaro, and Woodruff-Borden (2017)	1	Case study	Body compassion focused work embedded within ongoing therapy • Body compassion operationalized as defusion, CH, and acceptance • Compassionate body scan • Body compassion letter • Body thoughts log	None	Filipino male self-referred to a university-based community psychological services clinic Age: 40 years BMI: 37	Five sessions (50 minutes) over five weeks 1-month, 3-month and 18-month follow up	• Body compassion scale • BIAAQ • Appearance Evaluation and Body Areas Satisfaction Scale • Social Physique Anxiety Scale	No significance values reported Progressive improvements in all body compassion subscale scores from baseline to 18-month FU with the exception of common humanity No marked difference in AE, BASS and SPAS at post-treatment, but improvements were seen from 1-month FU to 18 months

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
4. Braun, Park and Conboy (2012)	31	Prospec-tive cohort	Kripalu Yoga Programme: • Workshops, yoga, lectures • Self-compassion embedded into each yoga class • All sessions emphasize the importance of self-care and listening to and honouring the body's needs • Sharing circles: opportunity to hear about others' struggles • One workshop explicitly addresses self-compassion and body image	None	Overweight (BMI ≥ 25) yoga programme registrants "Primarily female" "Primarily middle aged" Mean BMI: 84% were classified as having an obese BMI (> 30)	Daily 90-minute yoga sessions, five workshops and two lectures over 5 days 3-month and 1-year follow up	• Body weight • Health promoting lifestyle profile (nutrition, physical activity subscales) • FFMQ • SCS	Significant difference between T1 and T2 in: • Nutrition ($p < .001$) • Physical activity ($p < .001$) • Self-compassion ($p < .001$) • All facets of mindfulness ($p < .01$) Significant difference between T1 and FU: • Nutrition ($p = .01$) • Physical activity ($p = .53$) • Self-compassion ($p < .001$) • Observe, describe and reactive facets of mindfulness ($p < .05$) • Body weight at 1 year ($p < .001$)
5. Braun, Park and Gorin (2016)	Study 1: 22 Study 2: 21	Prospec-tive cohort	Kripalu Yoga Programme: Yoga: Includes breathing exercises, relaxation, self-soothing, sharing circles (as in Braun, Park and Conboy, 2012) Lectures: Mindfulness teachings and meditations 3/4 lectures included SC in study 1 3/10 lectures included SC in study 2	None	Overweight (BMI ≥ 25) yoga programme registrants Gender: 100% female Study 1: Mean yoga experience: 2.2 years Mage: 48.2 Mean BMI: 30.8 Study 2: Yoga experience: < 4 sessions in lifetime Mage: 49.4 Mean BMI: 35.5	10 weeks Study 1: Four 2-hour (lecture and yoga) workshops and six purely yoga sessions Study 2: 20 (lecture and yoga) workshops 3-month follow up	• Body weight • The Mindful Eating Questionnaire • The Weight Efficacy Lifestyle Questionnaire • The Body Awareness Questionnaire • The Situational Inventory of Body Image Dysphoria—Short Form • SCS	Significant difference between T1 and T2 in: • Body image dysphoria ($p = .001$ for study 1, $p = .02$ for study 2) • Weight self-efficacy ($p = .001$ for study 1, non-significant for study 2) • Body awareness ($p = .002$ for study 1, $p = .04$ for study 2) • Mindful eating ($p = .001$ for both studies) • SC ($p = .004$ for study 2, but marginal for study 1, $p = .08$) Results held at FU. Greater improvements in SC at FU in study 1 ($p = .003$) and study 2 ($p = .01$) Significant changes in weight loss in study 1 at FU, but no significant changes in in study 2 ($p > 0.05$)

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
6. Duarte, Pinto-Gouveia, and Stubbs (2017)	20	RCT	Compassionate Attention and Regulation of Eating Behaviour [CARE] Guided self-help programme: • 2.5-hour presentation on emotion regulation, binge eating and self-compassion • Manual and online audio exercises in compassionate imagery based on CFT and traditional mindfulness • Final group session at end of 4 weeks	Waitlist	Portuguese females with DSM-V criteria for BED, not currently receiving psychological treatment 100% female Mage: Intervention group = 37.73 Control group = 35.78 Mean BMI: 31.89	4 weeks No follow up	• BMI • Eating Disorder Examination 17.0D • Binge Eating Scale • Body Image Shame Scale • Cognitive Fusion Questionnaire-food craving • FFMQ • The Compassionate Engagement and Action Scales • SCS	Significant interaction for Time x Group in: • Binge eating symptoms ($p < .001$) • Restraint ($p < .001$) • Eating concern ($p < .001$) • Shape concern ($p < .001$) • Weight concern ($p < .001$) • Over-evaluation ($p < .001$) • Binge eating episodes (p = .04) • Cognitive fusion with food craving ($p = .001$) • Psychological flexibility regarding body image ($p = .02$) • Non-judging facet of mindfulness ($p = .001$) • Ability to engage in compassionate actions ($p = .01$) But not BMI ($p = .33$) or body image shame ($p = .17$) Marginal interaction affects for SC ($p = .054$)
7. Gale, Gilbert, Read and Goss (2014)	99	Retrospective cohort	Group CFT CFT covered in sessions 7 and 8 and a compassionate stance taken in later sessions • Theories underpinning CFT • Barriers to compassion • Compassionate interventions including imagery and letter writing	None	Eating disorder diagnosis recruited through Coventry Eating Disorders Service. EDNOS (5%) AN (19%) BN (26%) 96% female Mage: 28.01 years (17-62 years)	Twenty 2-2.5 hour sessions over 16 weeks with 2 hours of homework No follow up	• EDE-Q • The Stirling Eating Disorder Scale • No measure of self-compassion	Significant improvements shown in: • Restraint ($p < .02$) • Eating concern ($p < .02$) • Shape concern ($p < .02$) • Weight concern ($p < .02$) • Anorexic dietary cognitions ($p < .02$) and behaviours ($p = .002$) • Bulimic dietary cognitions ($p < .02$) and behaviours ($p < .02$)

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
8. Hopkins (2017)	518	Non-RCT	Self-compassion writing task: After recalling body shame experience, ps asked to: • list examples where other people might experience similar feelings (CH) • write an understanding letter to themselves as if expressing concern and kindness to a close friend (SK) • describe feelings about the experience in an objective fashion (M)	None	US adults partly recruited from online ED forums, reporting at least one of: caloric restriction, binge eating, purging or compensatory behaviours 100% female Mage: 24.09 (17 – 69 years)	One session No follow-up	• EDE-Q 6.0 • OAS • Externalized Bodily Shame Scale • The Internalized Bodily Shame Scale • Three-item scale of eating-related shame • SCS (only measured once)	Significant difference in scores across induction in: Internalized Shame (p = .01) Externalised body shame (p < .001) Internalized Body Shame (p < .001) Eating-Related Shame (p < .001) Significant differences in baseline shame and scores after shame prime in internalised body shame (p = .002) and eating-related shame (p = .003)
9. Karpiak and Strategis, (2015)	112	RCT	Ps received compassionate religious readings from the Bible focusing on behaving with kindness towards others even when they have broken the rules Manipulation check: Ps instructed to write a paragraph that captured the main points of their readings	Experimental control 1: received readings from the Bible focusing on the benefits of following rules and dangers of breaking them Experimental control 2: received readings containing no religious references, emphasizing learning over grades, and were affirming rather than perfectionistic	US, Catholic undergraduates from Jesuit university 76% female Mage: 19.0 years	One session No follow-up	• The Appearance Schemas Inventory-Revised Short Form • The Schwartz Value Survey • The Religious Commitment Inventory • BES for Adolescents and Adults with three scales: • Appearance esteem • Weight esteem • Attribution esteem (how others respond to their appearance) • No measure of self-compassion	Significant main effect of group for Body Esteem attribution scale (p = .03) and marginal effects on the appearance scale (p = .06) Relative to the other groups, ps in the self-compassion group showed significantly higher appearance body esteem, when Religious commitment was high (p = .01), and significantly higher weight and appearance esteem when Spirituality and Tradition values were high (p = .03) Participants with high Tradition values but low Spirituality had significant lower appearance esteem scores in the compassion than the authoritarian group (p < .01)

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
10. Kelly and Carter (2015)	41	RCT	Guided self-help based on CFT: • Initial audio guided slideshow taken from Goss' (2011) self-help guide for overeating • Exercises in imagery, positive self-talk and letter writing • Basic psychoeducation about food planning and monitoring	1 x experimental control: Behavioural self-help group • Initial audio guided slideshow based on "Alternatives to Binge Eating" (Fairburn, 1995) • Distraction techniques derived from book • Basic psychoeducation about food planning and monitoring 1 x baseline control: Waitlist	Canadian adults meeting DSM-5 criteria for BED, binge eating for a mean of 42.3% of life, not receiving psychological treatment 83% female Mage: 45 years	3 weeks No follow-up	• BMI • EDE-Q • Credibility and Expectancy Questionnaire • Fears of Compassion Scale • SCS	Both interventions reduced weekly binge days more than the control group ($p < .01$) Significant interaction effect for Time x Group in: • EDE-Q global score ($p < .05$) • Weight concern ($p < .01$) • Eating concerns ($p < .05$) • Self-compassion ($p < .01$) Lower baseline fears of self-compassion in the SC group predicted significantly greater improvements in ED pathology ($p < .001$). No significant changes to BMI in any groups ($p > 0.5$)
11. Kelly, Wisniewski, Martin-Wagar and Hoffman (2017)	22	RCT	CFT group • The evolution of the brain • Using self-compassion for negative feelings • Barriers to compassion • Imagery exercises • Self-compassionate statements and behaviours • Self-compassionate letter-writing • Asking for and receiving compassion from others • TAU (psychiatrist, nutritionist, individual weekly therapy)	TAU	Canadian patients receiving outpatient therapy in an ED treatment centre. AN (30%), BN (15%), EDNOS (35%), BED (20%). 96% female Mage: Intervention group = 36.73, Control group = 27.10	12 weekly ninety minute sessions No follow-up	• EDE-Q 4.0 • Experiences of shame scale • Fears of compassion scales • Feasibility and Acceptability Measures • Credibility and expectancy questionnaire • SCS	Significant interaction for Time x Group in: • Shame ($p < .05$) • EDE-Q global symptoms ($p < .01$) • Self-compassion ($p < .001$) • Fear of self-compassion ($p < .05$)

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
12. Loader and Goss (2013)	36	RCT	CFT based Guided Self help • "Compassionate mind approach to beating overeating" book: evolutionary theory, safe place imagery, mindful attention, soothing system, soothing breathing, compassionate diary • Telephone contacts with trainee clinical psychologist (up to 12)	TAU: psycho-education group about nutrition and exercise	Obese (BM = 30+) outpatients accessing treatment at a specialist NHS weight management clinic 69% female 20 – 50 years	6 months 3-month follow up	• EDE-Q • The Three Factor Eating Questionnaire Revised 18-item version • The General Practice Physical Activity Questionnaire • OAS • SCS	No significant main effects of time and group in any outcome variables in completers analysis or intention to treat analysis ($p > .05$)
13. Mantzios and Wilson (study 1)	72	RCT	Diary with concrete questions: Before each meal, diaries prompted ps to answer procedural questions about the food e.g. "How does it smell?" Manipulation check: Diaries were returned to the researchers to evaluate attendance	Diary with abstract questions: Before each meal, diaries prompted ps to answer abstract, judgment based question's (e.g. "why is it important to eat less?")	University students in Greece responding to advert for study looking at methods of weight loss 42% female Mage: 21.11 Mean BMI: 25.55	5 weeks, 3 x daily No follow up	• BMI • Mindful attention and awareness scale • Automatic thoughts questionnaire • Cognitive behavioural avoidance scale • SCS	Compared to the abstract construal group the concrete construal group: • Lost significantly more weight ($p <. 001$) • Scored greater in mindfulness post-test ($p < .001$) Main effect of time was significant for SC ($p = 0.02$) but no main effect of Group Type ($p = 0.11$)
14. Mantzios and Wilson (study 2)	98	RCT	Diaries with concrete questions: Before each meal, diaries prompted ps to answer present oriented questions infused with SC messages e.g. • "How important is it for me and all people to eat healthy?" (CH) • "How kind are you to yourself now that you eat this meal?" (SK)	Meditation course: 3-day meditation course including loving kindness. Asked to follow mediations (3 times daily with counsellor) incorporating mindful eating and SC meditations	University students in Greece responding to advert for study looking at methods of weight loss 42% female Mage: 23.30 Mean BMI: 25.79	5 weeks, 3 x daily 3-month follow up	• BMI • Mindful attention and awareness scale • SCS	Main effect of time was significant for SC ($p < .001$) but no main effect of Group Type ($p = .56$) For mindfulness, significant main effect of time ($p < .001$) and also a significant main effect of Group Type ($p = .03$), but interaction ($p = .66$) was non-significant ($p > 0.05$). For weight loss, significant interaction between Time and Group ($p < .001$) at FU

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
15. Mantzios and Wilson (2015)	63	RCT	Mindfulness with self-compassion • 2-day course and reading material on loving kindness meditations • 3 x daily practice with teacher for 5 weeks • 6-months lone practice • Generic literature on weight loss Manipulation check: daily log of attendance	1 x experimental control: Mindfulness meditation group • Same as self-compassionate group but for traditional mindfulness 1 x baseline control Generic literature on weight loss	Military employees in Greece with BMI < 40 responding to advert for study looking at methods of weight loss 35% female Mage: 22.03 Mean BMI: 26.63	7-months active participation 5-month follow up	• Body weight • Questionnaire asking if ps were still practicing meditation, if they would continue what they learned after this point, and the reason why they would maintain or quit • No measure of self-compassion	No significant main effect of group for weight loss ($p = .15$) At 5-weeks both groups lost significantly more weight than the control ($p < .001$) At 6-months, the Mindful SC group lost significantly more weight than the mindfulness ($p < .001$) and control groups ($p < .001$) At 1 year, the mindful SC group lost most weight overall but did not reach statistical significance ($p > .05$)
16. Murn (2008)	28	RCT	Expressive writing task: For twenty minutes, ps asked to write about their "best possible self" i.e. their thoughts and feelings if they have achieved everything they wanted Manipulation check: assessed ps perception of their writing	Ps were asked to write a neutral factual account of their day	US university students recruited in exchange for course credit 68% female Mage: Intervention = 25.14 (18-37 years) Control = 25.14 (19-40 years)	Twenty minutes for 3 days 6-10 week follow up	• BES • Body Comparison Scale • The Rosenberg Self-Esteem Scale • SCS	No significant interaction for Time x Group, in: • SC ($p > .05$) • Body esteem ($p > .05$) • Body comparison ($p > .05$) Self-esteem was significantly greater in the SC group at post-test ($p = .01$) and FU ($p = .03$).

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
17. Palmeira, Pinto-Gouveia and Cunha (2017)	73 (59 in final analyses)	RCT	"Kg-Free" programme • Self-compassion (in last two sessions): evolutionary approach to understanding eating, weight and emotions • Loving-kindness meditation • Compassionate friend exercise • Compassionate self exercise • Compassionate letter writing • Mindfulness and ACT • Medical and nutritional appointments (TAU)	TAU (Medical and nutritional appointments)	Enrolled in nutritional treatment for weight loss in primary care in Portugal. BMI > 25, but without BED diagnosis 100% female 18 – 55 years	10 weekly sessions and two booster fortnightly sessions for 2.5 hours each No follow up	• Weight self-stigma Questionnaire • Obesity Related Well-Being Questionnaire • Three Factor Eating Questionnaire-21R • Acceptance and Action Questionnaire for Weight-Related Difficulties-Revised • BMI/waist circumference/ cholesterol/body composition analyser • Forms of Self-Criticizing/Attacking & Self-Reassuring Scale • FFMQ – 15 • SCS	Significant improvements in the intervention group in: • Weight self-stigma ($p < .001$) • Emotional eating ($p = .001$) • Uncontrolled eating ($p < .001$) • Waist circumference ($p = .04$) • Total cholesterol ($p = .007$) • BMI ($p = .001$) • Physical exercise ($p < .001$) • Mindfulness ($p = .005$) • Inadequate-self ($p < .001$) • Self-compassion ($p = .001$) • Weight-related experiential avoidance ($p < .001$) No significant differences between scores in any variables for TAU, other than cholesterol ($p = .04$)
18. Pinto-Gouveia, Carvalho, Palmeira, Castilho, Duarte, Ferreira, Duarte, Cunha, Matos and Costa (2016)	31	Non-RCT	Be-free programme: • Evolutionary foundations of emotions and binge eating as an emotional regulation strategy. • Imagery: loving-kindness, safe-place, compassionate image • Mindfulness: mindfuln breathing meditations, body scan, mindfulness of thoughts • ACT: values and committed action	None	Diagnosed with binge eating disorder, partly recruited through endocrinology department of the university hospital in Portugal 100% female Mage: 39.68 Mean BMI: 35.35	Twelve weekly sessions, 2.5 hours each 3-month and 6-month follow up	• EDE 16.0D • BMI • Binge Eating Scale • OAS • Cognitive Fusion Questionnaire • Forms of Self-Criticising Scale • FFMQ- 15 • SCS	Significant improvements in: • Eating psychopathology ($p < .001$) • BMI ($p = .008$) • Binge eating symptoms ($p < .001$) • External shame ($p = .001$) • Psychological inflexibility ($p = .001$) • Body image cognitive fusion ($p = .001$) • Self-criticism ($p = .004$) • 3/5 mindfulness facets: acting with awareness ($p = .02$), non-judging ($p = .002$) and non-reacting ($p = .02$). Results held at 3 and 6 month follow-up

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
19. Pinto-Gouveia, Carvalho, Palmeira, Castilho, Duarte, Ferreira, Duarte, Cunha, Matos and Costa (2017)	59 (36 in final analysis)	Non-RCT	Be-free programme as in Pinto-Gouveia, Carvalho, Palmeira, Castilho, Duarte, Ferreira, Duarte, Cunha, Matos, and Costa (2016)	Waitlist	As in study 18. 100% female Mage: Intervention group = 42.72 Control group = 41.00 Mean BMI: Intervention group = 34.49, Control group = 35.06	12 weekly sessions, 2.5 hours each 3-month and 6-month follow up	As in study 18.	Significant interaction for Time x Group in: • Eating psychopathology (p = .001), binge eating (p < .001), external shame (p = .01), psychological inflexibility (p = .01), cognitive fusion (p = .01) • Self-criticism dimension of the SCS (p < .001). No significant changes in BMI (p = .35), overall mindfulness (p = .182), overall SC (p = .16). • Significantly higher SC score at 3M (p = .01) and 6M (p = .02) FU, compared with control group.
20. Rodgers, Franko. Donovan, Cousineau, Yates, McGowan and Lowy (2017)	274	RCT	BodiMojo, a mobile app featuring: • Compassionate messages delivered twice daily featuring elements of CH, SK and M: including affirmation, behavioural tip, psychoeducation or link to a quiz/audio meditation • Mood record • Gratitude journal	Waitlist	Adolescents recruited from two high schools, two local youth organizations and a university in the US. 74% female Mage = 18.36 years	6 weeks intervention 6-week follow up	• BES for Adolescents and Adults • Physical Appearance Comparison Scale • BIAAQ • SCS	Inclusive of 6 week FU, significant interaction for Time x Group in: • Appearance esteem (p = .02) • Self-compassion (p = .002) But not: • Appearance comparison (p = .11) • Body image flexibility (p = .80)
21. Seekis, Bradley and Duffy (2017)	96	RCT	Self-compassion writing task: After imagining difficult scenario, given 3 prompts: • list ways that others judge their image/ feel inadequate about how they look (CH) • re-write the scenario from a perspective without negative self-judgment (M) • write a letter to yourself expressing understanding and concern (SK) Manipulation check: Two raters assessed extent that writings aligned with prompts	Experimental control 1: Self-esteem writing task Ps asked to list characteristics they like about themselves, and other positive reframes Experimental control 2: Ps asked to answer questions relating to academia/university	First-year psychology students in Australia, recruited in exchange for course credits 100% female Mage: 19.45 (17–25 years)	Fifteen minute intervention period 2-week follow up	• State Body Appreciation Scale-2 • BISS • The Physical Appearance State and Trait Anxiety Scale – state version • Scenario believability • Rosenberg's Self-Esteem Scale • 3 items from SCS	• SC group had significantly higher body appreciation than SE group (p = .01) but not at FU (p = .06) • SC and SE groups scored significantly higher body satisfaction than the control group ((p = 002 and (p = .02). Results held at FU. No main effect of group for appearance anxiety (p = .05). • For SC, the SC group scored significantly greater than SE group (p < .001) and control group (p < .001) • For SE, the SE group scored significantly greater that SC group (p = .02) and control group (p = .01)

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
22. Seo (2016)	186	RCT	Innate Compassion Training (ICT) Ps emailed link to 20-minute podcast of Tibetan form of loving kindness with no background music	Experimental control 1: Mindfulness: Ps emailed link to 20-minute podcast Experimental control 1: Body image reading: Ps emailed link to 20-minute podcast of an article on improving body image (no emotional content)	Three cohorts of university students in US and women recruited through online body image support groups 100% Female 18-24 was modal age range	Cohort one: 3-5 times weekly for 3 weeks Cohort two: 3-5 times weekly for 1 week Cohort three: once, 6-week follow up	• BISS • Body dissatisfaction – BSQ-16A • BAS • CSW Appearance Scale • SCS	Every measure in all groups changed statistically significantly between pre and post-test. ICT did not perform significantly better than MM ($p > 0.5$)
23. Slater, Varsani & Diedrichs (2017)	160	RCT	Experimental condition 1: Ps presented with images containing a SC quote on an aesthetic background Experimental condition 2: Ps presented with 15 of the images used in the experimental control interspersed with five of the images used in experimental condition 1 Manipulation check: ps were asked to recall features of the images they had just viewed	1 x experimental control: Ps presented with Instagram images of young women with lean and toned bodies 1 x baseline control: interior images	Psychology university students in England and Wales recruited in exchange for course credits Gender: 100% female Mage: 21.21 (18 - 25 years) Mean BMI: 23.37	5-minute intervention period No follow up	• State body dissatisfaction (visual analogue scales) • Body appreciation (visual analogue scales) with three items from the BAS • Physical Appearance Comparison Scale • Sociocultural Attitudes Towards Appearance Scale-3 • SCS	Groups viewing self-compassion images reported significantly greater scores than the control group in: • Body satisfaction ($p < .001$) • Self-compassion ($p < .001$) Group viewing self-compassion images amongst lean and toned women reported greater body satisfaction ($p < .001$) and body appreciation ($p < .01$) than the group who viewed the women only No difference in body satisfaction between the baseline control group and experimental control group ($p > .05$)

Author/Date	*N*	Design	Intervention	Control	Population	Duration	Measures	Key findings
24. Toole & Craighead, 2017	80	RCT	Meditation podcasts from Mindful Self-compassion programme (as in Albertson et al., 2014)	No meditations	University students in US recruited in exchange for course credits, not currently meditating 100% female Mage: 18.85 (18 - 21 years) Mean BMI: 22.20	Approx. 1 week No follow up	• BMI • BAS • BSQ (Short-form) • The Body Surveillance and Body shame subscales of the Objectified Body Consciousness Scale • CSW Appearance Subscale • SCS	Controlling for BMI, main effect of group was significant for: • Body appreciation (p = .047) • Body surveillance (p = .026) • Body contingent self-worth (p =.044) But not: • Body dissatisfaction (p = 0.23) • Body shame (p = 0. 476). Main effect of time (p = .031) but no time x group interaction (p = .082) for SC. Self-criticism dimension of the SCS was significantly greater for the intervention group (p = 0.001)
25. Williams, Tsivos, Brown, Whitelock & Sampson, (2017)	9	Case series	Individual CFT • Collaborative development of a CFT formulation • Evolutionary understanding of the brain • Specific CFT skills: safe place imagery, compassionate letter writing • Non CFT-specific techniques: distraction, self-soothing Specialist dietetic appointments (range: 2– 11)	None	Patients in UK meeting criteria for ED according to *DSM-5*. BN (n = 5), OFSED (n = 4) 100% female Mage: 29.33 years Mean BMI: 23.20	10-27 50 minute sessions, fortnightly No follow-up	• EDE-Q • No measure of self-compassion	Significant decrease in eating-disordered thoughts and behaviours between baseline and final session in all subscales of the EDE-Q Five patients (56%) scored less than 1 SD above the community mean in the EDE-Q, post-treatment Seven patients (78%) demonstrated clinically reliable improvement in their EDE-Q scores at the end of treatment

Note. SC = self-compassion, Ps = participants, BAS = Body appreciation Scale, BSQ = Body Shape Questionnaire, BISS = Body Image States Scale, SCS = Self-compassion Scale, OAS = Other as Shamer Scale, EDE-Q = Eating Disorder Questionnaire, BIAAQ = The Body Image-Acceptance and Action Questionnaire, FFMQ = Five Facet Mindfulness Questionnaire, BES = Body Esteem Scale, CSW = Contingent Self-worth, FU = follow-up, EDNOS = Eating Disorder Not Otherwise Specified, CH = Common Humanity, M = Mindfulness, SK = Self-kindness

1.4.2 Quality assessment

Table 4 summarises the final quality rating for each study, with reasons to support each rating described in Appendix A. Given the preliminary nature of the topic area, the only study which was excluded on the basis of methodological limitations was one case study (Altman et al., 2017) where interventions targeting compassion were used as a five session additive component to a 67 session Mindfulness and Acceptance-based intervention. Moreover, no statistics were reported to support supposed changes led by the intervention. There was a risk of bias present in all studies included in this review however. Many of the samples were self-selected or homogenous in terms of demographic factors, reducing generalizability and increasing selection bias across the papers. Randomisation methods were reported in only nine papers but in most cases where there were significant differences between groups at pre-test, these were controlled for in the final analyses. Methods of blinding were omitted across most of studies and it is possible this may have contributed to a performance and detection bias in some of the trials. Dropout rates ranged from 0-52% with reasons given in only four of the studies. Manipulation checks were used in only half of the interventions and these were not presented without limitations. Finally, six of the studies featured incomplete reporting of some of the primary outcome variables. As such, the findings surmised in this review are interpreted throughout the results and discussion in light of these possible sources of bias.

Table 4

Component and global ratings of quality for each paper

Authors	Selection	Design	Confounders	Blinding	Data collection	Attrition	Global rating	Areas of poor quality
Randomised controlled trials								
Adams et al., (2007)	Moderate	Moderate	Weak	Moderate	Moderate	Strong	Moderate	Baseline differences between groups not stated. Some selective reporting
Albertson et al., (2014)	Strong	Moderate	Strong	Moderate	Moderate	Weak	Moderate	52% attrition
Duarte et al., (2017)	Weak	Moderate	Strong	Moderate	Moderate	Moderate	Moderate	Demographically homogenous sample, 46% of eligible participants chose not to take part
Karpiak et al., (2015)	Strong	Strong	Strong	Moderate	Moderate	Strong	Strong	Cronbachs α was not reported for some measures
Kelly et al., (2015)	Weak	Strong	Strong	Moderate	Moderate	Moderate	Moderate	Demographically homogenous sample. 44% of potential sample did not participate
Kelly et al., (2017)	Moderate	Strong	Strong	Weak	Moderate	Moderate	Moderate	Small sample. Lack of blinding for ps may have influenced behaviour in intervention
Loader et al., (2013)	Weak	Strong	Strong	Weak	Moderate	Moderate	**Weak**	65% of the ps who were eligible chose not to take part. Lack of blinding for ps may have influenced behaviour in intervention
Mantzios et al., (2014)	Strong	Moderate	Weak	Strong	Moderate	Weak	**Weak**	Baseline differences between groups not stated. 47% attrition
Mantzios et al., (2014)	Strong	Moderate	Weak	Strong	Moderate	Moderate	Moderate	Sig difference in mindfulness between groups at baseline (not controlled for)
Mantzios et al., (2015)	Moderate	Moderate	Strong	Strong	Strong	Moderate	Strong	Army sample not entirely generalizable

Authors	Selection	Design	Confounders	Blinding	Data collection	Attrition	Global rating	Areas of poor quality
Randomised controlled trials								
Murn, 2008	Weak	Moderate	Strong	Moderate	Moderate	Strong	Moderate	Insufficient power: Only 9% of original sample consented to take part in expressive writing part of trial
Palmeira, et al., 2017	Moderate	Strong	Strong	Weak	Moderate	Moderate	Moderate	Lack of blinding for ps may have influenced behaviour in intervention
Rodgers, et al., (2018)	Moderate	Strong	Strong	Moderate	Moderate	Strong	Strong	Improvements in control group were not explained
Slater, et al., (2017)	Moderate	Strong	Weak	Strong	Moderate	Strong	Moderate	Differences between groups in trait appearance comparisons not controlled for
Seekis, et al., (2017)	Moderate	Strong	Strong	Strong	Strong	Strong	Strong	Demographically homogenous sample (female psychology students, aged 17–25 years)
Seo (2016)	Moderate	Strong	Weak	Strong	Moderate	Weak	**Weak**	Baseline differences between groups not stated. Up to 83% attrition
Toole et al., (2017)	Moderate	Moderate	Strong	Moderate	Moderate	Strong	Strong	Not possible to ascertain whether participants who opened meditations actually completed them

Authors	Selection	Design	Confounders	Blinding	Data collection	Attrition	Global rating	Areas of poor quality
Non-randomised controlled trials								
Altman et al, (2017)	NA	Weak	NA	Weak	Moderate	NA	**Weak**	Poor intervention integrity. Lack of blinding for ps and outcome assessor may have influenced behaviour in intervention.
Braun, et al., (2012)	Weak	Moderate	NA	Moderate	Moderate	Strong	Moderate	Demographically homogenous (female, Caucasian, high levels of education), self-selected sample. Only 47% of those contacted expressed interest to take part
Braun, et al., (2016)	Weak	Moderate	NA	Moderate	Moderate	Moderate	Moderate	Demographically homogenous (female, Caucasian, high levels of education), self-selected sample
Gale, et al., (2014)	NA	Moderate	NA	Moderate	Weak	Weak	**Weak**	Poor intervention integrity**.** Cronbach's α not reported, missing data, lack of blinding for ps may have influenced behaviour in intervention. 43% attrition
Hopkins (2017)	Strong	Moderate	NA	Moderate	Moderate	Strong	Strong	
Pinto-Gouveia, et al, (2016)	Moderate	Moderate	NA	Moderate	Moderate	Weak	Moderate	39% did not proceed with trial after screen. Poor intervention integrity
Pinto-Gouveia, et al., (2017)	Weak	Moderate	Strong	Moderate	Moderate	Weak	**Weak**	44% did not proceed with trial after screen. Poor intervention integrity. Allocation to group dependent on whether p could attend group
Williams et al., (2017)	Moderate	Weak	NA	Weak	Strong	Strong	Moderate	Element of self-selection as intervention only offered to those patients who considered CFT to be an acceptable approach. Varying number of sessions. No formalised checks regarding therapist adherence to CFT

Note. ps = participants, sig = significant

1.4.3 Categories of intervention

1.4.3.1 Brief induction

Three studies were able to demonstrate that a self-compassionate induction can be effective in protecting against body dissatisfaction in as little as two (Adams & Leary, 2007) to five minutes (Slater et al., 2017). These were through receiving a brief 112-word compassionate message from the researchers (Adams & Leary, 2007), reading compassionate biblical excerpts (Karpiak & Strategis, 2015) and viewing images of self-compassionate quotes extracted from a popular social media platform (Slater et al., 2017). The intervention group in the first trial exhibited significantly greater self-compassionate eating attitudes and marginally less dietary disinhibition than controls but no assessment of body image was undertaken. In comparison, the compassion intervention group in Karpiak and Strategis' (2015) trial exhibited significantly higher attribution body esteem relative to controls and the compassionate intervention group in Slater et al., (2017) trials reported greater body satisfaction and body appreciation than the control groups. In the first two trials these outcomes emerged after participants were presented with a task which aimed to threaten their body image including dietary rule breaking (i.e. having to eat a doughnut, Adams & Leary, 2007) and ranking photos of fashion models (Karpiak & Strategis, 2015). In Slater et al.'s (2017) study, the compassionate quotes were layered between images of young, toned women for half of the participants in the intervention group, and these participants still reported significantly higher body satisfaction and body appreciation relative to controls. However, baseline group comparisons were not reported by Adams and Leary (2017), and Slater et al. (2017) did not account for baseline differences between groups, where the experimental control group reported a significantly higher tendency to make appearance comparisons, so this may have skewed outcomes and findings should be interpreted with caution.

1.4.3.2 Meditation training

Four of the studies in the review attempted to train participants to be more self-compassionate through meditation. Albertson et al., (2014) and Toole and Craighead (2017) adapted the Mindful Self-Compassion programme (summarised in Table 3) developed by Neff and Germer (2013), by emailing guided meditation podcasts to adult females. Compared with control groups receiving no meditations, in both trials the intervention groups improved in appearance contingent self-worth and body appreciation, but only in the first trial for body dissatisfaction and body shame. Results held at three month follow up in the first trial but in the second trial no follow up data was collected. Attrition accounted for more than half of the original sample where the

meditation course lasted three weeks, whereas dropouts rates were only 8% for Toole and Craighead (2017) who concluded the course after one week, which could explain the slight difference in outcomes. The other major difference between the trials was that although Toole and Craighead's (2017) trial was shorter, participants reported having only listened to the meditations 1.5/6 times (approximately half of what was reported by Albertson et al., (2014)) and 61% of the intervention group indicated that they would not have been willing to practice for another two weeks, primarily because the meditations were "too long". This may have reflected the samples recruited by the trials where only Albertson et al., (2014) advertised for participants with body image concerns, and so these participants may have been more invested in trying the meditations. However, as neither of the trials used an active control group significant effects may have been accountable to confounding properties of the podcasts or participant expectations of the intervention.

Another two meditation trials included active mindfulness control groups in order to reduce the risk of performance bias, with Seo (2016) recruiting from body image forums and Mantzios and Wilson (2015) advertising the study to army employees wanting to lose weight. Seo (2016) found that all three groups included in the trial improved in measures of body satisfaction, body dissatisfaction, body appreciation and appearance contingent self-worth, but there were no differences between groups. However, baseline differences between groups were not reported. In Mantzios and Wilson's (2015) trial, the mindful self-compassion group lost significantly more weight than both the pure mindfulness and control groups which gained weight at six months, but differences were not statistically different after one year, when participants reported having stopped meditating because they no longer wanted to lose any more weight. The researchers thus concluded that the meditations must have helped participants to initially lose weight, to a level where they were more satisfied with their body image. Since body image was not measured however, this assumption remains unsupported. Dropout rates were high across groups in Seo's (2016) trial and for the self-compassion and pure mindfulness groups in the first week of Mantzios and Wilson's (2015) trial. However, no participants dropped out after this point.

1.4.3.3 Compassionate Diaries

In a bid to find a form of compassion training less arduous and more effective than daily meditation, Mantzios and Wilson (2014) conducted two trials where they gave participants diaries to answer a series of questions before every meal. Participants were recruited on the basis of wanting to lose weight and the hypothesis was that the diaries which asked procedural, present-oriented ("concrete") questions about the participants' food would prime participants to be more

mindful and less judgmental about their eating habits, thus mimicking self-compassion. Five weeks later, participants who were given the diaries with concrete questions exhibited significantly higher mindfulness scores and lost significantly more weight than those given diaries asking abstract, value-laden questions. In the second study when the effect of similar concrete diaries was compared with a traditional loving kindness meditation course matched for duration, mindfulness improvements did not significantly differ between groups, both groups lost the same amount of weight, but the diary group regained less at follow up. Although the researchers theorised that the diary intervention would be less taxing and more "effortless" than the meditation group, attrition rates were not statistically different. Aside from weight loss, neither of these trials assessed whether the interventions affected the participants' attitudes towards their shape/weight, so the mechanisms behind the outcomes observed are unclear.

1.4.3.4 Yoga

Yoga is another type of self-compassion training that has been evaluated within the literature. Braun, Park and Conboy (2012) and Braun et al., (2016b) assessed two Kripalu yoga programmes for overweight females. Kripalu translates as compassionate or merciful in Sanskrit and so self-compassion is said to be embedded into the yoga and teaching sessions. After just five days, scores were significantly greater in terms of weight loss, physical activity, nutrition and mindfulness in the first trial and these were maintained at one year follow up. In the two longer 10 week trials that were conducted after this, more psychological variables were assessed and significant changes in body image dysphoria, weight self-efficacy, body awareness and mindful eating were reported. In this second study, more participants engaged in the first trial which featured a higher proportion of compassion-focussed yoga sessions to teaching sessions. However, participants in the second trial had significantly less yoga experience, which could also explain why a higher number discontinued. In both studies, there were multiple interventions co-occurring within the yoga programmes, with some distinct from self-compassion altogether. These included cookery demonstrations, nutrition classes, food planning workshops and lifestyle teachings and without a control group the confounding nature of these variables remains unaccounted for. With regards to conflict of interests, both of these studies were funded by a grant from the Kripalu centre for yoga and health, but the authors asserted that these were carried out for scientific rather than marketing purposes.

1.4.3.5 Expressive writing trials

Expressive writing tasks have been another common intervention for generating self-compassion in participants, and were used by three studies included in the review. Findings from

two of these studies demonstrated significant improvements in scores of internalized and externalized body shame (Hopkins, 2017) and state body satisfaction and body appreciation (Seekis, Bradley & Duffy, 2017), using writing tasks which prompted participants to elicit common humanity, self-kindness and mindfulness. In contrast, following the 'best possible self' writing task in Murn's (2014) study (as described in table 3), there were no significant differences in measures of body esteem or body comparisons across the intervention, or compared with the control group who wrote a factual account of their day. It is possible that this writing task did not sufficiently map onto the three components of self-compassion in the same way as the ones used by Hopkins (2017) and Seekis et al., (2017), and so did not prompt significant improvements in self-compassion. The intervention group did instead show significantly higher improvements in self-esteem than the control group, suggesting that the writing task may have targeted this instead.

Another possibility is that the impact of Murn's (2014) writing task may have been limited by the use of a non-clinical, undergraduate sample who exhibited baseline body image scores which were closer to the normal range. Hopkins (2017) may have overcome this issue by first screening participants for caloric restriction, binge eating, purging and compensatory behaviours, and therefore producing a sample with lower baseline body image. As well as this, both Hopkins (2017) and Seekis et al., (2017) induced a state of threat in participants before trying to cultivate self-compassion in response to feelings arising from the sense of threat. Specifically, Hopkins (2017) asked participants to mentally recall a time they experienced intense shame, relating to their eating, shape or weight and Seekis et al., (2017) asked participants to imagine a scenario where a friend had posted unflattering photos of them on social media which all groups rated more than 4.74/5 for believability. The inclusion of the threat induction in both of these trials may have activated the threat system in participants, triggering feelings associated with higher body dissatisfaction. In turn, this may have made participants more amenable to the influence of self-compassion and facilitated the significant outcomes.

However Seekis et al., (2017) did not assess the impact of the threat prime, prior to introducing the writing task and so it is unclear whether this had any effect on baseline body image. Although Hopkins (2017) did assess outcome variables across the threat induction, internalized and externalized body shame in fact marginally reduced from baseline after presenting the shame prime, rather than increasing as expected. As there was no control group, it is difficult to rule out the possibility that the reduction in body shame following the intervention was due to a prolonged habituation response to the shame prime, rather than the self-compassion induction. In comparison, Seekis et al., (2017) did include two control groups, involving a writing task designed to promote self-esteem and a neutral task. Whilst the self-esteem group also showed higher state body

satisfaction post-intervention and at two-week follow-up, body appreciation was significantly higher in the self-compassion group (but only immediately post-intervention and not at follow-up).

1.4.3.6 Groups

Five of the studies included in the review administered training in self-compassion in a group format using various elements of CFT. This model integrates technical training in skills such as compassionate meditations, diary recording and expressive writing within a wider theoretical framework which explains the evolutionary rationale behind cultivating compassion for self and others, as well as receiving compassion. First, Gale at al., (2014) completed a retrospective analysis of seven years' worth of routine data collected from a series (number not stated) of CFT groups run in a UK Eating Disorders service for patients meeting a clinical diagnosis of AN, BN or Eating Disorder Not Otherwise Specified (EDNOS). Significant improvements were seen in all subscales of the EDE-Q as well as in anorexic dietary cognitions and behaviours and bulimic dietary cognitions and behaviours. The group was shown to be particularly successful for participants with BN, with 73% of cases considered to be "recovered" at the end of treatment, whereas 30% of EDNOS patients and 21% of AN patients obtained recovery status. No control group was included as a comparison, however, so improvements could have been attributed to other co-occurring factors.

Another three group interventions conducted in Portugal by Pinto-Gouveia et al., (2016; 2017) and Palmeira et al., (2017), adapted aspects of CFT for overweight and obese female outpatients, with the first two trials also screening for Binge Eating Disorder. In Pinto-Gouveia et al.'s (2016) first trial, all participants saw a significant reduction in binge eating symptoms, so that they no longer met the clinical criteria for a diagnosis of BED. There was also a significant reduction in eating pathology (not reported in specific domains), external shame, BMI and body image cognitive fusion, and results were maintained at six month follow up, but again no control group was included. In the authors' second trial (using a control group), there was a significant reduction in the same variables, relative to the waitlist control group where no significant improvements were seen. Palmeira et al., (2017) instead compared findings to a control group receiving routine nutritional and medical appointments (treatment as usual (TAU)). Significant improvements were seen in the intervention group for weight self-stigma, emotional and uncontrolled eating, weight-related experiential avoidance, inadequate self and mindfulness abilities, relative to TAU where there were no changes other than reduced cholesterol. These effects were still found to be significant when controlling for BMI post intervention suggesting that the impact of the intervention was direct and outcomes were not due to changes in weight.

Although at first glance, these outcomes are quite compelling, attrition rates were poor across most of the trials. In the two studies conducted with participants with BED, 42-44% of participants allocated to the intervention groups either dropped out or never attended the groups, compared with 44% for Gale et al., (2014). According to programme protocol described by Gale et al., (2014), the course was largely CBT oriented and featured no compassionate material prior to sessions seven and eight and even these sessions involved aspects of Dialectical Behavioural Therapy and CBT. Hence it is difficult to ascertain the relative contribution of the compassion focussed work. Similarly, all of the groups designed for overweight/obese participants incorporated self-compassion training into a predominantly ACT based programme, so it is unclear as to whether self-compassion was an active component in the trials.

Most recently, Kelly and colleagues (2017) conducted a twelve-week group design for ED outpatients in Canada which focussed more purely on CFT than the other group trials and demonstrated the lowest attrition. Group CFT offered in combination with TAU was more clinically significant than TAU alone, for patients' levels of shame, fears of compassion and eating disorder pathology. Since a higher proportion of sessions adopted a CFT based agenda, it is more realistic to attribute these outcomes to the compassion-focussed material, than in the other group trials. The sessions were up to an hour shorter as well, which may have aided engagement. At the end of the intervention, over 85% of participants said they would recommend the group, and although the sample size was very small, this was a promising finding given that all participants had been receiving individual therapy for their eating disorder diagnosis for an average of two years.

1.4.3.7 Self-help

A seemingly more succinct and resource efficient way of presenting the materials provided in group CFT is through self-help manuals and another three trials looked at the efficacy of using such manuals in developing self-compassion. Based on CFT, the "compassionate mind approach to beating overeating" was used by Loader and Goss (2013) and Kelly and Carter (2015) with obese adults seeking treatment. In the first trial, compared with a control group receiving TAU alone, there were no significant differences in scores in eating pathology and physical activity and half of the participants discontinued the trial. In the second trial the intervention reduced eating disorder pathology, and weight and eating concerns significantly more than a behavioural self-help manual and a waitlist control group (although BMI, shape and restraint concern did not improve in any of the groups). Kelly and Carter (2015) only included patients with a diagnosis of BED, who may

have been more motivated to change. However, they also spent one session socializing their participants to the CFT model before leaving them to read and practice the techniques in the manual. In comparison the participants in Loaders and Goss's trial were left to read the manual with intermittent telephone conversations with the researcher, but without any initial support. In a similar vein, with another sample of participants with BED, Duarte, Pinto-Gouveia and Stubbs (2017) also presented an initial introductory presentation before distributing self-help materials to the self-compassion intervention group. After 4 weeks, symptoms significantly improved in binge eating, eating psychopathology, cognitive fusion with food cravings and psychological flexibility regarding body image compared to a control group.

The final self-help intervention was distinct from the others in that it was sampled on non-clinical adolescent participants and was administered via a mobile phone app. This integrated aspects of CFT and mindful self-compassion. In this trial, only two out of six variables (appearance esteem and self-compassion) improved significantly more in the intervention group, which might have again been due to using a sample with relatively normal baseline body image scores.

1.4.3.8 Case series

Finally, one case series (Williams et al., 2017) was included in the review. This demonstrated overall significant improvement in all subscales of the EDE-Q, and 5/9 patients were considered to be clinically recovered at the end of their sessions. As well as the CFT aspects covered above, each case received their own personalised CFT formulation which may have helped participants to relate to the concepts better. Dietetic appointments were also offered to participants which might have confounded outcomes.

1.4.4 Manipulation checks

Where self-compassion was measured in the studies, the Self-compassion Scale (Neff, 2013) was the most commonly used assessment tool, whereas the more recently developed Compassionate Engagement and Action Scales (Gilbert et al., 2016) was only used once. Out of the 24 trials, although 22 claimed to show significant improvements in body image variables through training participants to be more compassionate, only half of these reported co-occurring significant improvements in self-compassion post intervention. In four of these studies, the self-compassion intervention group saw statistically equivalent increases in self-compassion as the control groups (Toole & Craighead, 2017; Mantzios & Wilson, 2014; Seo, 2016). Seven studies did not even compare self-compassion pre and post induction at all (Gale et al, 2014; Slater et al., 2017;

Mantzios & Wilson, 2015; Adams & Leary, 2007; Hopkins, 2017; Karpiak & Strategis, 2015; Williams et al., 2017). This meant that only 36% (n = 8) of the studies provided evidence to suggest that body image distress improved alongside an increase in self-compassion associated with training that explicitly targeted self-compassion. However, some of the trials did find significant improvements in just the self-criticism dimension of the SCS (Toole & Craighead, 2017; Pinto-Gouveia, et al., 2017) and two of the trials (Pinto-Gouveia, et al., 2017; Braun et al., 2016) found that self-compassion increased significantly at follow-up suggesting that it could take longer for people to properly assimilate self-compassion as a skill.

1.5 Discussion

Overall, only a minority (8%) of the interventions did not lead to significant improvements in body image (including measures of weight loss), and when considered in terms of intervention method, at least one study in each category illustrated significantly greater improvements. It is therefore important to examine the supposed mechanisms behind these interventions, to tease out whether the presented outcomes support the underlying theoretical models. Furthermore, a holistic approach needs to be taken which interprets outcomes in the context of improvements in self-compassion (alongside body image), confounding factors, attrition, and follow-up data, as well as general methodological weaknesses in the studies.

1.5.1 The three factor model of self-compassion

In the interventions developed from Neff's three-dimensional model of self-compassion, self-compassionate meditational practice improved some body image variables in all of the interventions and increased self-compassion when this was measured (although Mantzios and Wilson (2015) did not measure this across the intervention). The overall conclusion in most of the trials was that loving kindness meditations helped to elicit common humanity, self-kindness and mindfulness in participants which in turn provided participants with respite from self-criticism and feelings of inadequacy towards their bodies (Toole & Craighead, 2017). However, adherence to the meditations appeared to taper off, raising doubts as to whether this type of intervention was sustainable. The exception to this was Mantzios and Wilson's (2015) trial where participant engagement might have been promoted by one-to-one support with the meditations. This was the only trial to collect follow-up data after six months in more than half of the self-compassion experimental group, but this was solely in relation to weight loss which is an unpredictable

variable. As well as adherence issues, the evidence was inconclusive as to whether self-compassionate meditations offered any additional benefit to traditional mindfulness meditations, since trials that compared both types of training (Mantzios & Wilson, 2015; Seo, 2016) did not report a significant difference in outcome improvement (other than for weight loss at six months for Mantzios et al., (2015)). This finding was surprising given that traditional mindfulness meditations do not explicitly aim to promote a sense of common-humanity or self-kindness.

The self-compassionate diaries also aimed to increase common humanity, mindfulness and self-kindness and when these were compared to loving-kindness meditations (Mantzios et al., 2014) produced similar outcomes for weight loss and self-compassion immediately post-test, with levels of attrition reflective of the standalone meditation interventions. In terms of weight loss, however, for the participants who attended follow up, those completing the diary entries regained less weight in the self-compassion group than those in the meditation group, with the authors suggesting that participants might have found it easier to continue using the diaries, following the trial. However, for the diary trials and the trial conducted by Mantzios et al., (2015), participants were recruited with the goal of wanting to lose weight, and since no other body image variables were measured, this may have added an additional commitment for participants, which does not necessarily align with the ideology behind self-compassion and may contributed to higher dropouts.

Over half of the brief induction and expressive writing trials focussed on evoking a sense of common humanity, mindfulness and self-kindness to improve self-compassion in participants (Adams & Leary, 2006, Seekis et al., 2017, Hopkins, 2017) with Slater et al. (2017) also defining self-compassion according to Neff's (2003) model. Although these trials produced significant outcomes for body image, only between subject effects were measured in the brief induction trials, and thus it cannot be assumed that there would have been any changes within subjects across time, as found in the expressive writing trials. Since these brief inductions only delivered compassionate messages without actively generating self-compassion from within the participant, it is likely that these messages might have served as a protective buffer against threatening body image stimuli rather than prompting substantial shifts in body satisfaction within participants, but no within participant data was retrieved for self-compassion to support this theory.

Due to having only one phase to the study there were no dropouts in any of the brief induction trials, but this also meant that almost no follow-up data was collected, possibly because the researchers assumed the effect of such brief interventions would be relatively short-lived. That

said, in the one expressive writing trial (Seekis et al., 2017) that did examine follow up data (2 weeks after the intervention) outcomes were still significantly greater than controls even when participants had only completed the writing task once so it is possible that these tasks produced sustained results. Of course, none of these studies gave participants the opportunity to practise on their own outside the lab so it is difficult to compare attrition rates to the other types of intervention. For a task which might be more cognitively taxing than meditation and diary entries, it is possible that participants would be less motivated to spend time developing skills in self-compassionate writing, so it would be useful for future research to assess this and collect follow up data as well. Furthermore, the outcomes from the expressive writing trials should be interpreted in the context of the findings from the trials using loving kindness meditations where these did not outperform tradition mindfulness meditations. It might be helpful to compare an expressive writing task focussing solely on increasing mindfulness against a writing task that aims to elicit all three dimensions of Neff's construct of self-compassion. This would help to clarify whether common humanity and self-kindness help to buffer negative body image above and beyond what is achieved through mindfulness alone.

Both the yoga programmes included in the review and Neff's model of self-compassion derive from Buddhist principles, which could explain why the yoga intervention shared some overlap with the trials discussed above. For example, components of the yoga course including mindfulness, relaxation and sharing circles seemingly mapped directly onto mindfulness, self-kindness and common humanity, even though these were not explicitly referred to. Moreover, in the yoga trials, there were significant improvements in self-compassion using Neff's Self Compassion Scale. Critically though, since the yoga studies took place in a retreat setting, the significant outcomes in these trials and low attrition rates might not be entirely generalizable. These outcomes were however maintained at follow up in all variables other than physical activity, suggesting that participants might have continued to apply the skills learned (other than yoga) outside of the retreat. However, significant follow-up data in body image variables may also have been due to initial weight loss during the trial, rather than an increase in self-compassion per se. As such it is difficult to establish the relative contribution of the self-compassion training.

1.5.2 Compassion Focussed Therapy

The clinical trials included in the study were all to some degree based on CFT, which focusses on helping patients to give and receive compassion to and from others as well as to the self, which may have provided an additional means to seek solace from body image distress, when compared with Neff's model which solely focusses on self-compassion. Moreover, since the programme derives from Gilbert's evolutionary model of compassion, these trials also provided another component to the other interventions in that they explained the theoretical rationale for

developing compassion and attempted to troubleshoot blocks around this. This may have helped participants to subscribe to experimenting with the techniques more and to overcome fears to compassion (Gilbert, 2011), but also extended the length of the interventions which may have contributed to the higher attrition rates. Although, this is unclear since detailed descriptions of when or why participants dropped out were only provided in two studies. As (albeit promising) follow up data was only obtained in the two trials with highest dropout rates, it is difficult to infer the long-term effects of group CFT. In comparison to the groups, the case series (Williams et al., 2017) indicated that a higher proportion of patients continued to engage with CFT when this was delivered through individual therapy for an even longer duration, and so attrition in group CFT could have been down to difficulties arising from group therapy rather than the content of the sessions. However, an absence of follow up data again leaves questions unanswered regarding the long term effectiveness of one-to-one CFT interventions.

Out of the guided self-help interventions that included CFT training, the two trials which were more effective in terms of body image and self-compassion, were those which included an initial session that explained the basic concepts and techniques around compassion and self-compassion and when participants were given less time to develop their compassionate skills, unsupported. Although Loader and Goss (2013) claimed to use a "guided" self-help approach, non-significant effects may have been because too much onus was placed on the individual to develop compassionate skills, without an initial training period which may have also been the case for the mobile phone self-help intervention (Rodgers et al., 2018). The benefit of this socialization period was also observed in the yoga studies and Mantzios and Wilson's (2015) mindfulness trial where there was a consistent period of communal, supervised training, which might suggest that learning to develop self-compassion should be scaffolded in a social context, which aligns with Gilbert's (1989) model, whereby self-compassion is part of the affiliative system in the brain.

However, most of the self-help samples used were relatively small, featured high dropout rates and no follow-up data was obtained, so it is only possible to speculate the reasons behind differences in these trials. These studies should therefore be replicated with larger clinical samples before it is possible to judge their effectiveness. Additionally, more self-help interventions need to be trialled out in clinical populations who are not overweight (but not significantly underweight) such as cases with BN and EDNOS.

1.5.3 Threat induction

A further interesting finding from this review was that the studies which presented more significant findings in non-clinical participants, did so after active recruiting participants with body image concerns (Albertson et al., 2014; Hopkins, 2017) or by incorporating some kind of threat induction such as asking participants to look at images of thin ideals, to eat "forbidden" fattening foods or to imagine/recollect shameful scenarios regarding body-image (Adams & Leary, 2007; Karpiak et al., 2015; Slater et al., 2017 Seekis et al., 2017; Hopkins, 2017). This supports Gilbert's (1989) notion that self-compassion operates well when an individual is in a state of threat, even though only one of these studies drew upon this theoretical model of self-compassion, thus indicating that there are theoretical parallels between Gilbert's evolutionary model, and Neff's description of self-kindness in the face of adversity. Whereas threat levels might be readily activated in individuals suffering from an eating disorder, these studies suggest that it might be important to artificially induce a sense of threat in non-clinical participants where feelings of body dissatisfaction might only be activated in certain contexts. As such, although the mobile phone intervention (Rodgers et al., 2018) operationalised Neff's three dimensional model of self-compassion, improvements in body image may have been restricted by the fact that participants' body image weren't (generally speaking) in a compromising position prior to the intervention. On the other hand, only Hopkins (2017) assessed whether the threat induction actually influenced baseline body image scores (i.e. body shame), and in this case body shame did not increase. Future research needs to use more comprehensive manipulation checks, to qualify the role of threat in this model.

Overall, manipulation checking within the studies included in this review was one of the weakest aspects of their designs, especially with regards to changes in self-compassion. The finding that self-compassion significantly improved in such a small proportion of the interventions, relative to controls, prompts two possible explanations: i) the inductions which helped to improve body image were acting through a variable which was distinct from self-compassion or ii) the self-compassion scale did not adequately capture increases in self-compassion pertaining to body image. Interestingly, although the self-compassion scale is inherently based on Neff's three-dimensional definition of self-compassion, studies which were not based on this model produced greater improvements on this scale (i.e. a CFT based group (Kelly et al, 2017), a CFT guided self-help intervention (Kelly et al, 2015) and the yoga interventions (Braun et al., 2012; Braun et al., 2016)). This indicates that the self-compassion models included in this review fundamentally complement each other in terms of working towards and achieving similar aims. As well as the Compassionate Engagement and Action Scales (Gilbert et al., 2016), used in one of the trials, Altman (2017) recently developed the body compassion scale as an alternative means of measuring self-compassion and acceptance in relation to the body, and researchers are beginning to adopt this

construct alongside Neff's three-dimensional model of self-compassion (e.g. Oliveira et al., 2018). In the future, studies should continue to focus on a wider range of compassion based measures which might be more sensitive to change in compassion in the context of body image (Rodgers et al., 2018).

1.5.4 Avenues for future research

The research to date suggests that there is great overlap across the various theoretical frameworks underpinning self-compassion interventions for body image, and so this review suggests a number of recommendations for future research. As well as addressing inconsistencies in changes to scores in self-compassion, more rigorous randomized controlled trials need to be run in a wider range of clinical populations, including inpatient samples. These trials should strictly adhere to self-compassion training, using Mindful Self-Compassion protocols or versions of CFT that do not include large components of CBT, DBT and ACT to discern the extent to which the compassion focussed interventions uniquely contribute to clinically significant outcomes. Research should also continue to compare the unique impact of different trans-theoretical techniques (meditation, yoga, diaries, expressive writing etc...) and in group, one-to-one and (ideally guided) self-help formats to ascertain not only which exercises add more value, but which medium of delivery is most beneficial post-test and at follow up. This should help in developing effective and concise intervention programmes, which might ultimately keep more patients engaged, to reduce dropouts as well as helping to manage service demands. For when clinical samples are unavailable, it will be useful for studies to consider inducing a state of threat in participants around the self-compassion induction, and to examine eating disorder and body-image related outcomes as well as self-compassion at each stage in the process (within and between participants).

1.5.5 Conclusion

Findings across 24 studies provide preliminary evidence for the efficacy of self-compassion interventions in improving outcomes relating to body dissatisfaction. However, a number of methodological factors need to be addressed before it is possible to confidently conclude that the interventions were acting through self-compassion and not confounding mechanisms. Recommendations for future research therefore highlight the importance of refining interventions with clearer and more varied manipulation checks, larger samples, purer treatment protocols (excluding other therapeutic models and extraneous factors), and more active control groups. Furthermore, if it is the case that self-compassion operates best in the context of threat, future

research might better capture its effects either in clinical populations or by artificially inducing threat in non-clinical participants.

Chapter 2 Can self-compassionate letter writing counteract the impact of thin ideals on body image

2.1 Introduction

Eating disorders such as Anorexia Nervosa (AN), Bulimia Nervosa (BN), Binge Eating Disorder (BED) and Eating Disorder, Unspecified are characterized by a preoccupation with shape and weight alongside persistent disturbances in eating or weight-control behaviours (ICD-10). These disorders are associated with significantly elevated mortality rates (Hoek, 2006; Steinhausen, 2002; Arcelus, Mitchell, Wales & Nielsen, 2011), and so the development of effective and empirically supported interventions is of critical importance. Cognitive Behaviour Therapy now has an established evidence base with eight international clinical guidelines recommending its application across eating disorder classifications (Hilbert, Hoek & Schmidt, 2017). Whilst there is evidence to suggest that the delivery of CBT has improved treatment outcomes and retention rates (Fairburn et al., 2015), a full course of CBT has shown to be ineffective in 36-60% of cases (Byrne, Fursland, Allen & Watson, 2011; Fairburn et al., 2009; Fairburn et al., 2013; Waller et al., 2014). Furthermore, with high rates of attrition still consistently reported (Waller et al., 2014; Turner, Marshall, Stopa & Waller, 2015), there is a pressing need to develop adjunctive and even alternative treatment approaches. Recently, more eating disorder research has been devoted to testing the application of "third wave" behavioural therapies including interventions that promote self-compassion (e.g. Compassion Focussed Therapy (CFT; Gilbert, 2010), and Mindful Self-compassion (MSC; Neff & Germer, 2013)). These therapies have been used as standalone treatments (e.g. Kelly et al. 2015) and as an additional component in traditional CBT for eating disorders (Gale et al., 2014; Kelly et al, 2017) with promising efficacy across different diagnostic categories. The present study aims to contribute to this emerging body of research by examining the extent to which a self-compassionate intervention using letter writing can influence specific psychological processes associated with eating disorder symptomology. The goal of the study is to clarify the role that self-compassion might play in improving treatment efficacy for eating disorders.

2.1.1 Limitations of traditional CBT for eating disorders

Individuals with eating disorders commonly present with high levels of self-criticism (Fennig et al., 2008; Duarte et al., 2016) and self-directed hostility stemming from perceived flaws

and inadequacies, and this can act as a barrier to recovery (Goss & Allan, 2010; Kelly & Carter, 2013; van der Kaap-Deeder, Smets & Boone, 2016). Although CBT may help individuals high in negative self-evaluation to understand how to think more rationally about their difficulties, and to generate alternatives to their self-critical thoughts, in some cases this intellectual shift does not provide sufficient emotional reassurance (Gilbert, 2009). Some patients can be described as experiencing a "head-heart" lag (Lee, 2005) where there is a discrepancy between their intellectual and emotional reasoning, possibly due to the somewhat harsh tone of their cognitive reappraisals (Gilbert & Irons, 2005) and lack of emotional warmth to self (Lee, 2005), which can re-activate the body's stress response (Gilbert, 2005). Lee (2005) suggested that drawing upon techniques for increasing self-compassion may provide a means to facilitate this emotional shift by motivating individuals to attend to emotional suffering without judgment (Gilbert, 2017). This is instead of seeking to prevent, eliminate or change the emotional response i.e. by challenging the content of cognitions, as with CBT. Interventions in self-compassion are therefore worth investigating if they can help patients with eating disorders to overcome blocks to recovery associated with self-criticism (Goss & Allan, 2010).

2.1.2 Self-compassion and affect regulation

There are currently two key theories of self-compassion. As part of his broader definition of compassion, Gilbert (e.g. 1989, 2005) proposed that self-compassion is an awareness of personal suffering combined with a commitment to preventing and alleviating this. Neff (2003) instead emphasized the importance of taking a kind, understanding and accepting approach towards personal shortcomings, disappointments or distress through self-kindness (being understanding towards oneself), common humanity (acknowledging that suffering unites rather than divides human beings) and mindfulness (being aware of one's distressing thoughts and feelings without amplifying or suppressing these). In the most comprehensive description of compassion to date, Gilbert (1989) proposed that humans have evolved self-compassion as one of the primary mechanisms behind their soothe system. This soothe system functions to regulate emotions signalled by the threat-defense system that enables humans to respond automatically to threatening stimuli. The capacity to soothe the self is said to initially derive from early attachments, where nurturing strategies are modelled by the infant's primary caregiver(s). By consistently attuning and responding to their infant's emotions, caregivers are able to soothe their infant's experiences of anger, fear and disgust, and these skills are then internalized by the infant who learns to self-soothe. As such, individuals deprived of these caregiving experiences are often less able to manage personal distress due to an underdeveloped soothe system which is less rehearsed in helping the person to feel emotionally calm and cared for in the face of threatening stimuli and events (Gilbert & Irons, 2005).

2.1.3 Self-compassion and eating disorders

It has been suggested that individuals with eating disorders may struggle with accessing their soothe system to regulate difficult emotions associated with body dissatisfaction, which may in part be due to their own interpersonal history and cultural context (Goss & Allan, 2014). Instead of approaching their distress with kindness and concern, individuals develop a repertoire of safety behaviours to manage threats to body image (e.g. through restricting calorie intake or over-exercising) and these are reinforced as seemingly effective safety seeking strategies. As well as being driven by fear, if these behaviours are viewed as successful and elicit a sense of pride and excitement, they can also be supported by the third and final psychological system, the drive system, associated with pleasure and vitality (Goss & Allan, 2014). However, overreliance on these behaviours can become problematic when the individual's goals are oriented towards an unattainable thin ideal (Tiggemann, 2011), especially since the human body is biologically hardwired to seek out and consume food, and to maintain a minimum fat percentage for survival and reproduction (Goss & Allan, 2010). As a result, individuals are likely to feel shame and anxiety, when they are unable to achieve their body goals, leaving them with a sense of isolation and self-hostility at the expense of feelings of connectedness and contentment associated with the soothe system (Twenge et al., 2010). Ongoing self-criticism and hostility stimulate the threat system (Kelly, Vimalakanthan, & Miller, 2014) and again instead of inviting compassion from themselves or others, individuals approach this with further attempts to be thinner through restriction or attempts to numb and avoid distress through binge-eating and purging. In this way, these behaviours can become entrenched in vicious maintenance cycles and manifest as eating disorders (Goss & Allan, 2010).

2.1.4 Empirical evidence for low levels of self-compassion in eating disorders

Several studies have provided support for the notion that people with eating disorders may experience difficulties generating self-compassion, with evidence that eating disorder patients exhibit lower levels of self-compassion (Ferreira et al., 2013) and higher fears of compassion than their non-clinical counterparts (Kelly et al., 2014). Moreover, those with particularly low self-compassion have also showed a poorer response to treatment (Kelly et al., 2013). In non-clinical populations, low self-compassion was more prevalent amongst those reporting eating disorder symptoms such as body dissatisfaction (Duarte et al., 2015), and binge eating severity (Webb & Forman, 2013). Comparatively, high levels of self-compassion have been associated with adaptive eating attitudes such as body appreciation (Homan & Tylka, 2015), body image flexibility (Kelly et

al., 2014), lower weight gain concern (Breines et al., 2013) and behaviours such as intuitive eating (Schoenefeld & Webb, 2013).

2.1.5 Underlying mechanisms – how does self-compassion help?

Whilst there is some evidence that people with eating disorders present with lower levels of self-compassion, compared with non-clinical controls, there is ongoing debate as to how higher levels of self-compassion might interrupt the eating disorder pathway, and whether self-compassion reduces the initial occurrence of risk factors or moderates their impact (Braun, Park & Gorin, 2016). One line of thought suggests that through inner caring and supportive self-talk, self-compassion regulates difficult body image distress by enabling individuals to accept their imperfections and to deflect self-criticism and body shame associated with this (Goss & Allan, 2010) and Neff (2013) proposed that all three dimensions of self-compassion might contribute to this effect. Self-kindness is believed to help people value their self-worth beyond their physical appearance (Homan & Tylka, 2015), whilst common humanity is supposed to enable individuals to recognise that all bodies have flaws as opposed to experiencing feelings of isolation associated with body dissatisfaction (Wood-Barcalow, Tylka & Augustus-Horvath, 2010). Furthermore, mindfulness is regarded as a way of helping individuals to notice painful body-related thoughts in a non-judgmental way (e.g. “My body is unattractive”) and to adopt a more controlled and descriptive mindset which does not exaggerate perceived flaws (Albertson et al., 2014).

Through these means, self-compassion is believed to counteract two key eating disorder risk factors which can otherwise interact with cultural pressures around thinness to trigger feelings of inadequacy and distress (Ferreira et al., 2013). These processes are thin ideal internalisation, i.e. the degree to which individuals themselves subscribe and aspire to social standards of thinness, and social appearance comparisons, i.e. the extent to which individuals compare their bodies to their peers and other women (Thompson, Heinberg, Altabe & Tantleff-Dunn, 1999). Without self-compassion, these processes are likely to severely compromise body image, particularly for individuals residing in a Western context which promotes unrealistic beauty ideals (Ferreira et al., 2013). These ideas are supported empirically where higher scores in self-compassion have been associated with both lower thin-ideal internalisation (Tylka, Russell & Neal, 2015) and lower social appearance comparisons (Neff & Vonk, 2009). By the same token, Daye and Webb (2014) demonstrated that self-compassion weakened the links between early messages around thinness passed on by caregivers and body shame, suggesting that self-compassion can override pressures to be thin exerted in a variety of social domains. Overall, there is evidence to suggest that self-compassion might help individuals to reject thinness ideals and social appearance comparisons, or

at least buffer their influence (Tylka et al., 2014) and in turn promote healthier body image. To date, however, all of the studies investigating self-compassion alongside thin-ideal internalisation, social appearance comparisons and body dissatisfaction have used cross-sectional designs, and so it is unclear whether training individuals to be more self-compassionate would help to sufficiently inhibit these risk factors.

2.1.6 Treating eating disorders with self-compassion

There are a number of self-compassion interventions that have been used to treat eating disorders and body image concerns, some of which combine compassionate approaches with existing CBT treatments and others using mindfulness based self-compassion approaches that have been used as standalone interventions. Compassion-focussed-therapy (CFT; Gilbert, 2005) has been adopted as a means to train individuals to approach their eating disorder with a more compassionate mindset through the realignment of their threat, soothe and drive systems (Goss & Allan, 2014). CFT, in one-to-one, group and self-help formats have shown high rates of remission in those with BED (Pinto-Gouveia et al., 2017; Kelly & Carter, 2015), BN (Gale, Gilbert, Read, & Goss, 2014) and Eating Disorder Not Otherwise Specified (Kelly, Wisniewski, Martin-Wagar, Hoffman, 2017; Williams, Tsivos, Brown, Whitelock & Sam, 2017) but with less success in AN populations. In comparison, Mindful Self-compassion (MSC; Neff & Germer 2013) operationalises self-compassion according to Neff's (2013) three-dimensional (self-kindness, common humanity, mindfulness) model, and has been shown to significantly improve body dissatisfaction, body shame (Albertson et al., 2014) and body contingent self-worth (Toole & Craighead, 2017) in sub-clinical participants through guided self-compassion meditations. The methodological designs behind these interventions present a number of limitations, however. In the CFT trials, it is difficult to ascertain whether self-compassion was the active component in the changes observed, since most of these incorporated elements of CBT, Acceptance Commitment Therapy or Dialectical Behaviour Therapy. Moreover, some of the meditations used in MSC have been criticized for focusing more on developing benevolence and kindness for others than self-compassion (Mantzios & Wilson, 2015) and for not keeping participants engaged (Toole & Craighead, 2017). These limitations highlight the importance of testing alternative methods of inducing self-compassion, in order to accurately measure its effects on eating disorder symptomology.

An arguably purer approach to cultivating a self-compassionate mindset is through expressive writing tasks, and both CFT (Goss & Allan, 2010) and MSC (Neff, 2011) encourage the application of these. Improvements in body satisfaction, body appreciation (Seekis, Bradley & Duffy, 2017) and body shame (Hopkins, 2017) have been observed in non-clinical participants

asked to write for fifteen minutes in response to three prompts seeking to elicit self-kindness, common humanity and mindfulness. In both trials, the self-kindness prompt required participants to write a letter to themselves from a perspective of friend who expresses understanding and concern. Compassionate letter writing in its own right has been well documented as a technique for eliciting all three components of self-compassion (Neff, 2011) and although this can have a significant impact on psychological wellbeing in as little as five days (Shapira & Mongrain, 2010), it has never been assessed as an intervention for body image distress.

Altogether, although there is emerging evidence that self-compassion interventions can positively influence body image, since these interventions were based on different theoretical standpoints, sometimes included additional therapeutic models and frequently resulted in high attrition, the mechanisms behind change remains ambiguous. In fact, to the authors' knowledge, no studies which have trained participants in self-compassion for the purpose of improving body image, have assessed thin-ideal internalisation and social appearance comparisons across the intervention, to examine whether these interact with the outcomes observed. There is therefore a pressing need to empirically test the impact of a pure self-compassion intervention on these processes that predispose an individual to disturbed body image, as well as poor body image as a final product.

2.1.7 The present study

In order to build on the existing literature, the current study sought to compare scores on measures of thin-ideal internalisation and social appearance comparisons as well as on body satisfaction and body appreciation, across a week long compassionate letter-writing intervention. Body satisfaction was chosen due to the extensive literature suggesting that body dissatisfaction is one of the leading risk and maintenance factors of eating disorders (Thompson, 2000), as well sub-clinical problematic eating (Thompson, Coovert, Richards, Johnson, & Cattarin, 1995) and has been linked with both thin-ideal internalisation (Stice & Whitenton, 2002) and social appearance comparisons (Thompson et al., 1999). Body appreciation was also measured as the literature focusing on self-compassion has moved towards promoting this as a unique predictor of well-being (Avalos, Tylka, & Wood-Barcalowm 2005). In line with previous experimental approaches (Blond, 2008; Grabe, Ward & Hyde, 2008), in order to trigger the process of upward body comparisons, and activate internalized thinness ideals to highlight body image discrepancies, participants were first presented with a series of photographs of celebrity women epitomising the Western ideal of thinness (Heinberg & Thompson, 1995). This was in-keeping with evidence to date (Seekis et al., 2017; Hopkins, 2017) suggesting that activating a sense of threat in the context of body image,

provides a robust way to test the impact of a self-compassionate intervention since this encourages the soothe system to come online as a form of emotion regulation. Half of the participants then received a week-long intervention in compassionate letter writing (Shapira & Mongrain, 2010) which was not tied to one particular theoretical framework since compassionate letter writing is used in CFT and MSC. Self-compassion scores were measured to assess the intervention's efficacy as well as scores in self-esteem, as a positive self construct which is believed to be conceptually distinct from self-compassion since self-esteem is contingent on success and self-compassion can arise from mistakes and failures (Neff, 2011).

2.1.8 Objectives

The first aim of the current study was to examine the impact of presenting the thin ideal photographs to participants with existing body image concerns in terms of body satisfaction and appreciation and the two eating disorder risk factors; thin-ideal internalisation and social appearance comparisons. The study also sought to ascertain whether a self-compassionate intervention in letter writing could successfully improve participants' scores in each of these dependent variables. The third aim was to determine whether the intervention successfully manipulated participants' levels of self-compassion or if this affected self-esteem instead, as well as whether increases in self-compassion or self-esteem persisted across presentation of the thin ideals in the second test session. The final objective was to assess whether the self-compassionate intervention could successfully attenuate the effect of presenting the thin-ideals for the second time on scores of body satisfaction, body appreciation, thin-ideal internalisation and social appearance comparisons.

2.1.9 Hypotheses

1. Prior to the self-compassion intervention, exposure to thin ideals will activate body image concerns, by increasing thin-ideal internalisation, social appearance comparisons and decreasing body satisfaction and body appreciation.
2. In the intervention group, one week of self-compassionate letter writing will significantly improve scores on thin-ideal internalisation, social appearance comparisons, body satisfaction and body appreciation, compared with the control group which will see no changes.

3. In the intervention group, scores in self-compassion but not self-esteem will increase significantly more than the control group, following completion of the intervention for one week and also following exposure to the thin ideals.
4. Viewing the thin ideals in the second test session of the experiment will have significantly less of an impact on the four study variables, than in the initial test session, but only in the intervention group.

2.2 Methods

2.2.1 Participants

Participants were female staff and students based at a university in South East England (N = 62). A priori application of the statistical program G*Power 3.1 (Faul, Erdfelder, Buchner & Lang, 2009) determined the minimum number of participants, assuming power of 0.80 and a moderate effect size to be $N = 36$. The study was advertised as an investigation into how females feel about their body, on posters on the university campus, in exchange for course credits or monetary payment (£4/hour). All participants were screened for eligibility using the Eating Disorder Examination-Questionnaire (Fairburn & Beglin 1994) and those who obtained a global score of at least one standard deviation ($SD = 1.25$) above the community sample mean ($M = 1.52$; Mond, Hay, Rodgers, & Owen, 2006) were eligible to participate. This inclusion criteria was used in order to attain a sample of participants reporting: i) higher levels of body image distress relative to the normal population, ii) higher susceptibility to thin-ideal internalisation and upwards social appearance comparisons, and iii) symptoms characteristic of individuals vulnerable to the development of an eating disorder. Participants responding to the screening questionnaire ($N = 413$) were distributed between the current study and a separate trial comparing imagery and verbal interventions in individuals with body image concerns, since both trials required the same population. Participants were randomly assigned to only one of the two studies to avoid contamination effects (Figure 2 indicates overall patient acquisition, allocation and dropout across the study). Of the participants assessed for eligibility by the current study ($N = 225$), 117 were deemed eligible and were invited to take part. In order to obtain a sufficiently heterogenous sample there were no other exclusion criteria, other than being male, younger than 18 years old and not reaching the screening threshold. Of those invited to take part, 68 took part in the main experiment. All participants were asked to indicate their age and ethnicity at the beginning of the trial.

2.2.2 Design

The study used a 2 (group) × 4 (time) design. The experimental and control conditions were the self-compassion writing intervention (carried out twice in the laboratory and six times independently, outside of the laboratory), and no intervention. The four time points were:

i) Test session 1: Baseline
ii) Test session 1: After viewing the thin ideals, before introducing the self-compassionate intervention
iii) Test session 2: After completing the writing task for one week vs. no intervention for one week
iv) Test session 2: After completing the intervention for the final time in the laboratory and after viewing the second set of thin ideals

2.2.3 Measures

The following questionnaires were administered:

Eating Disorder symptomology. The Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin 1994) was completed as the online screening tool. This self-report measure comprised 28 items which assess disordered eating attitudes and behaviors over the past 28 days. Responses were rated on a seven point Likert Scale from 1 (No days) to 7 (Every day) with higher scores reflecting more eating-related pathology. Although the measure produced four subscale scores, only the global mean score was taken into account, as this was used to assess eligibility, whereby respondents scoring less than 2.77 were not invited to participate in the study. Information about height and weight was also self-recorded at this point and used to calculate Body Mass Index (BMI). Internal consistency was deemed to be high for this scale in the current study ($\alpha = 0.81$-0.84). Table 5 indicates the alpha values for all of the psychometric assessments at each time point the measure was completed, by both groups.

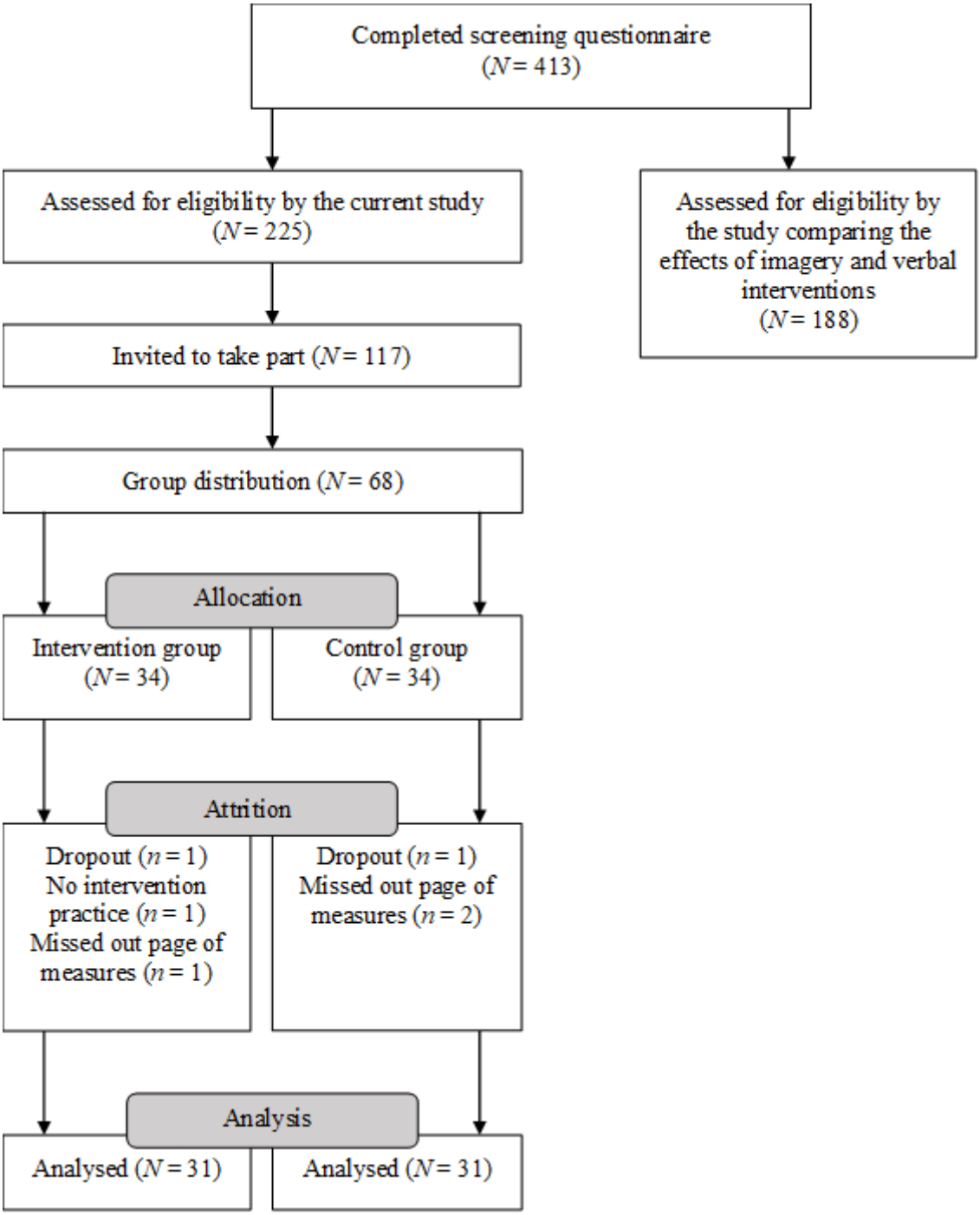


Figure 2. Participant allocation and dropout

Self-compassion. The 26-item Self-Compassion Scale (SCS; Neff, 2003) was used to assess the extent to which participants exhibited self-compassion and consisted of six subscales. The Self-Kindness subscale comprised items including "I try to be loving towards myself when I'm feeling emotional pain" whereas the Self-judgment subscale consisted of items such as "I can be a bit cold-hearted towards myself when I'm experiencing suffering". The Common Humanity subscale included items such as "I try to see my failings as part of the human condition", alongside the Isolation subscale (e.g., "When I'm feeling down, I tend to feel like most people are probably happier than I am"). The Mindfulness subscale was denoted by items such as "When I'm feeling down I try to approach my feelings with curiosity and openness" and the Over-Identification subscale contained items including "When something painful happens I tend to blow the incident out of proportion.". Responses were rated on a five-point Likert scale ranging from 1 (Almost never) to 5 (Almost always), with reverse-coded scores calculated for the negative subscales (i.e. self-judgment, isolation, over-identification). Mean scores on the six subscales were then averaged to create an overall self-compassion score. In addition to this, in line with Lopez (2015), who advocates a two factor model for the scale, the summed score of the negatively formulated items was calculated separately to the summed score of the positively formulated items to generate two discrete self-criticism and self-compassion factors, respectively. Internal consistency and reliability for the total scale has been indicated in previous trials (Albertson et al., 2014), and in the current study internal consistency was good ($\alpha = 0.87–0.95$).

Body satisfaction. Participants were asked to answer the question "How satisfied are you with your body right now?" on a 0 (not at all satisfied) to 10 (extremely satisfied) scale.

Body appreciation. The 13-item Body Appreciation Scale (BAS; Avalos et al., 2005) was used to assess participants' acceptance of and appreciation for their bodies and this is currently regarded as the most comprehensive measure of positive body image (Menzel & Levine, 2011). Items such as "I respect my body" were rated on a five-point Likert scale, ranging from 1 (Never) to 5 (Always). Among university women, scores on the BAS demonstrated internal consistency reliability and 3-week test-retest reliability and positive relationships to appearance evaluation and body esteem (Avalos et al., 2005). In the current study, Cronbach's Alpha demonstrated good internal constancy ($\alpha = 0.84–0.94$).

Thinness ideal internalization. The Internalization: Thin/Low Body Fat subscale (5 items) was taken from the Sociocultural Attitudes Towards Appearance Questionnaire-4 **(**SATAQ-4; Schaefer et al., 2014), a 22-item measure assessing sociocultural influences on appearance ideals. Items including "I want my body to look very thin" were rated on a five point Likert scale from 1 (Definitely Disagree) to 5 (Definitely agree). This full scale has previously shown excellent reliability and good convergent validity with several measures of body image, eating disturbance, and self-esteem (Schaefer et al., 2015). Cronbach's alpha was low (α = 0.39–0.79) in the current study which is more likely to arise when using subscales with less than ten items (Pallant, 2010; Tavakol & Dennick, 2011).

Body comparison. The Physical Appearance Comparison Scale Revised (PACS-R; (Schaefer & Thompson, 2014) uses 11 items to assess an individual's degree of overall appearance comparison to others. Items such as "When I'm out in public, I compare my body fat to the body fat of others" were rated on a five point Likert scale ranging from 0 (Never) to 4 (Always). The original version of the scale (Thompson, Heinberg, & Tantleff, 1991) is the most commonly used validated measure of appearance comparison (Myers & Crowther, 2009), and this revised version adds to this by including items assessing weight *and* shape comparisons as well as displaying improved psychometric properties (Schaefer & Thompson, 2014). In the current study, Cronbach's Alpha demonstrated good internal constancy (α = 0.84–0.93).

Self-esteem. The Rosenberg Self-esteem Scale (RSES; Rosenberg, 1965) was used to assess self-esteem. Although this instrument was designed as a trait scale, participants were required to complete the measure on the same occasions as the other measures to observe whether the self-compassion intervention could influence this in anyway. Ten items including "On the whole, I am satisfied with myself" were rated on a scale between 0 (strongly disagree) and 3 (strongly agree), with five items reversed scored. Internal consistency was considered to be high in the current study (α = 0.82–0.93)

Table 5

Cronbach's Alpha values for each of the study variables

		Time 1	Time 2	Time 3	Time 4
EDE-Q	SC	0.81	-	-	-
	Control	0.84	-	-	-
BAS	SC	0.92	0.93	0.92	0.94
	Control	0.91	0.91	0.84	0.86
SATAQ-4	SC	0.39	0.50	0.67	0.76
	Control	0.63	0.79	0.64	0.74
PACS-R	SC	0.93	0.91	0.91	0.93
	Control	0.91	0.91	0.84	0.86
SCS	SC	0.92	0.95	0.92	0.93
	Control	0.87	0.91	0.91	0.93
RSE	SC	0.87	0.93	0.88	0.82
	Control	0.83	0.88	0.89	0.87

Note. EDE-Q (Eating Disorder Examination Questionnaire), BAS (Body Appreciation Scale), SATAQ-4 (Sociocultural Attitudes Towards Appearance Questionnaire-4), PACS-R (Physical Appearance Comparison Scale Revised), SCS (Self-compassion Scale), RSE (Rosenberg Self-esteem Scale)

2.2.4 Threatening body-image stimulus

Two slideshows were presented to the participants, with each featuring 30 photographs of slim and attractive models from a highly acclaimed fashion show ("Victoria Secrets") interspersed with images of other supermodels to avoid repetition. Photos of the same fashion models have previously been shown to facilitate upward body comparisons (Chrisler, Fung, Lopez & Gorman, 2013). These photographs were piloted on another sample and were shown to significantly increase body dissatisfaction (Search & Stopa., 2017).

All photographs were randomly assigned to two separate slideshows so that participants did not view the same images during both test sessions of the experiment and the order in which these were viewed were counterbalanced so that half of the participants in each group viewed the first slideshow followed by the second and vice versa for the remaining participants. In both test sessions of the experiment the slideshows were presented for five minutes with each picture presented for 10 seconds. The models' names were specified at the bottom of the screen for each photograph and before viewing the images, participants were asked to recall the name of the model they considered to be the most attractive. This was to ensure that they sufficiently attended to the images, as it has been suggested that tasks which promote deeper processing result in more explicit body comparisons (Engeln-Maddox, 2005). Once all photographs had been viewed, participants were given the opportunity to briefly look through the images and names again.

2.2.5 Compassionate letter-writing task

Participants were asked to think about a recent upsetting situation or personal shortcoming and to write a letter to themselves from the perspective of a good friend, partner or family member, using instructions adapted from Gilbert (2007), Neff (2011) and Shapira and Mongrain (2010). Instructions encouraged the participants to generate statements of self-kindness (e.g. "Try to infuse your letter with a strong sense of your friend's acceptance, kindness, caring, and desire for your health and happiness,") as well as common humanity (e.g. "What would this friend write in order to remind you that you are only human, that all people experience difficult times and have both strengths and weaknesses?"). Mindfulness was incorporated into the exercise through the individual's acknowledgement and acceptance of their own distress (e.g. "Try to have understanding for your distress, e.g. I am sad you feel distressed".) The intervention was successfully piloted on eight adult females prior to the trial, where there was a significant difference in scores on the SCS before and after one attempt at the exercise, $t(7) = 5.73$, $p = .001$.

2.2.6 Procedure

Individuals responded to the study advert by following a link to an online survey hosted by the university which asked them to complete the online screening questionnaire and eligible participants were emailed an invitation to take part in the experimental sessions. Individuals who did not reach inclusion criteria were also informed via email. The initial experimental session took place in a university laboratory where participants were randomly allocated to the self-compassion or control conditions, using the "graphpad" online randomization generator: "https://www.graphpad.com/quickcalcs/randomize1" (Suresh, 2011). During the initial

experimental session, all participants were asked to complete the demographic form as well as the pre-intervention measures (SCS, body satisfaction, BAS, SATAQ-4, PACS-R, RSES) which were counterbalanced to control for order effects. All participants then viewed the first slideshow of idealized body images, and completed the same measures again. Those in the self-compassion condition were then trained by a trainee clinical psychologist to complete the compassionate letter-writing exercise, and given supplementary instructions to complete the exercise independently every day for a week. The researcher read through the initial letter written in the laboratory to check that the participant had understood the task and that the tone of the letter was not self-critical in any way (Gilbert, 2009). The participant was informed that all other letters written in the week would not need to be shared. Participants also received an email reminder with the task instructions each day at a set time (pre-determined by the participant) and were given a sheet with six boxes to tick, to specify each day they had performed the exercise. They were encouraged to use a different "difficult situation" each day and the option to write from the perspective of a variety of people who they felt a close connection to, to minimise monotony. For the second experimental session, one week later, all participants were asked to complete the measures for a third time and participants in the self-compassion condition were asked to carry out the compassionate letter writing exercise one more time, under the supervision of the study lead. They were then asked to view the second set of thin ideals and complete the measures again for a final time.

2.3 Results

2.3.1 Analytic Approach

After four participants were excluded for the reasons specified in Figure 2, there were no missing data at pre-treatment or post-treatment. Using SPSS Statistics Version 25 (IBM, 2017) t-tests were used to compare demographic and screening variables and then a series of mixed model analyses of variance (ANOVAs) were performed on the following dependent variables in order to test the key hypotheses: body satisfaction, body appreciation, thin-ideal internalisation and social appearance comparisons. The independent variables were Group (intervention and control) and Time. The time points included in the ANOVAs depended on the question under examination but included:

i) Baseline (T1)

ii) After viewing the first set of thin ideals at the first test session (T2)

iii) One week later after completion of the intervention or control conditions (T3)

iv) At the second test session after viewing the second set of thin ideals (T4).

Assumptions were examined before conducting the mixed model ANOVAs. Outliers and influential scores were identified via box-plots and removal of two identified scores (for BMI and thin ideal-internalisation) did not influence outcomes. Assumptions of sphericity were not met for all six variables and so Greenhouse-Geisser and Huynh-Feldt corrections were used for estimates that were lower than 0.75 or greater than 0.75 respectively. The assumption of normality was indicated by scatterplots for each of the study variables.

2.3.2 Baseline differences between groups

Demographic variables and global eating disorder pathology were compared between the intervention and control groups using t-tests. Scores reported in Table 6 revealed no significant differences between the intervention and control groups with regards to global eating disorder pathology (at screen) and BMI. However, there was a significant difference in age, with the intervention group being significantly older (MD = 5.6 years, p = .02) than the control group. All of the main analyses were re-run with age as a covariate, and there were no differences in the ANCOVA and ANOVA results, therefore the latter was used. This suggests that overall, the randomization procedure was successful at creating equal groups.

Table 6
Baseline differences in scores in screening and demographic variables

	Self-compassion *M* (SD)	Control *M* (SD)	*t*	df	Sig.
Age	27.10 (12.07)	21.48 (4.72)	2.4	60	.02*
BMI	24.52 (5.48)	24.71 (6.77)	0.12	60	.90
EDE-Q (global)	3.40 (0.71)	3.50 (0.83)	0.53	60	.60

Note. *Sig .05

2.3.3 Did exposure to thin ideals activate body image concerns?

The first question was whether the exposure to thin ideals in the first test session had the expected impact, namely reduced body satisfaction and appreciation, and increased social appearance comparisons and thin-ideal internalisation. This was evaluated using a series of 2 x 2

(group x time) mixed model ANOVAs. The two time points analysed were when questionnaires were administered prior to introducing the self-compassionate letter writing task (T1 and T2).

Body satisfaction and appreciation. For body satisfaction, there was a main effect of time, $F(1, 60) = 20.23$, $p < .001$, $\eta p^2 = 0.25$, but not of group, $F(1, 60) = 1.59$, $p = .21$, $\eta p^2 = 0.03$ and there was no group x time interaction, $F(1,60) = 0.06$, $p = .79$, $\eta p^2 = 0.001$. As predicted, the total mean score for body satisfaction was significantly lower after the thin ideals were presented (M = 3.43) than at baseline (M = 3.98). Similarly, for body appreciation, the main effect of time was significant, $F(1, 60) = 19.73$, $p < .001$, $\eta p^2 = 0.25$ but the main effect of group was non-significant, $F(1, 60) = 0.30$, $p = .58$, $\eta p^2 = 0.005$, and so was the group x time interaction, $F(1, 60) = 1.79$, $p = .19$, $\eta p^2 = 0.03$. Similar to body satisfaction, the overall mean score for body appreciation was significantly lower after participants viewed the thin ideals (M = 24.60) than at baseline (M = 26.26).

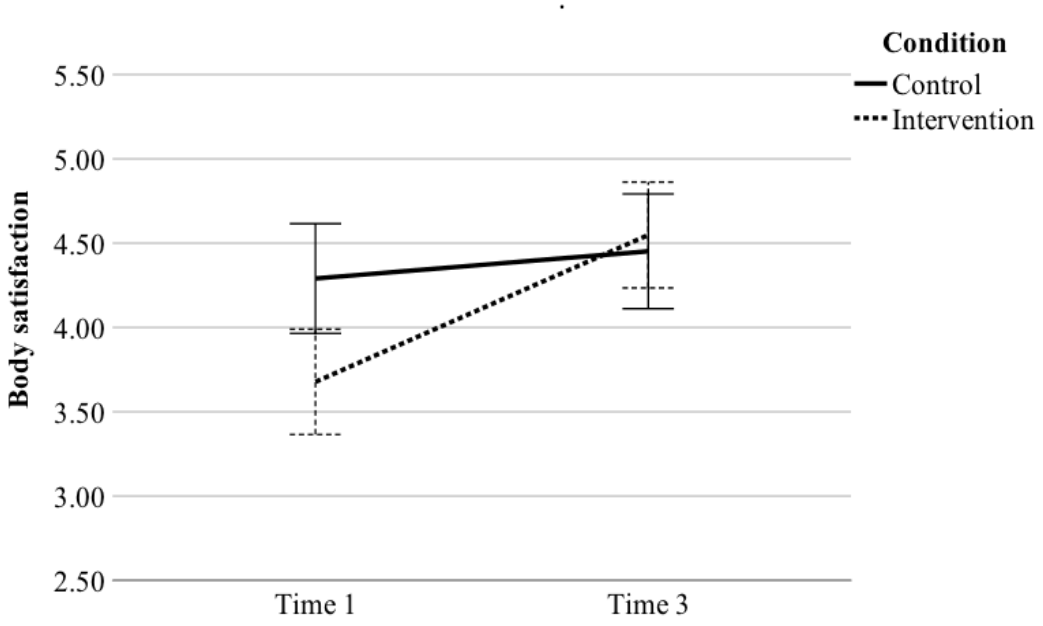
Social appearance comparisons and thin-ideal internalisation. For social appearance comparisons, the main effect of time was significant, $F(1, 60) = 6.51$, $p = .01$, $\eta p^2 = 0.10$ and again the main effect of group was non-significant, $F(1, 60) = 1.04$, $p = .31$, $\eta p^2 = 0.02$, as was the group x time interaction $F(1, 60) = 0.03$, $p = .85$, $\eta p^2 = 0.001$. In line with the predictions, participants in both groups had higher mean scores for social appearance comparisons (i.e. participants reported drawing more appearance comparisons) after the thin ideals were presented in the first test session of the experiment (M = 35.21) than at baseline (M = 34.10). The only variable that did not follow the predicted direction was thin-ideal internalisation, where the main effects of time, $F(1, 60) = 0.93$, $p = .76$, $\eta p^2 = 0.002$, and group, $F(1, 60) = 0.002$, $p = .97$, $\eta p^2 < 0.001$, were not significant, and there was no group x time interaction, $F(1, 60) = 0.006$, $p = .94$, $\eta p^2 < 0.001$.

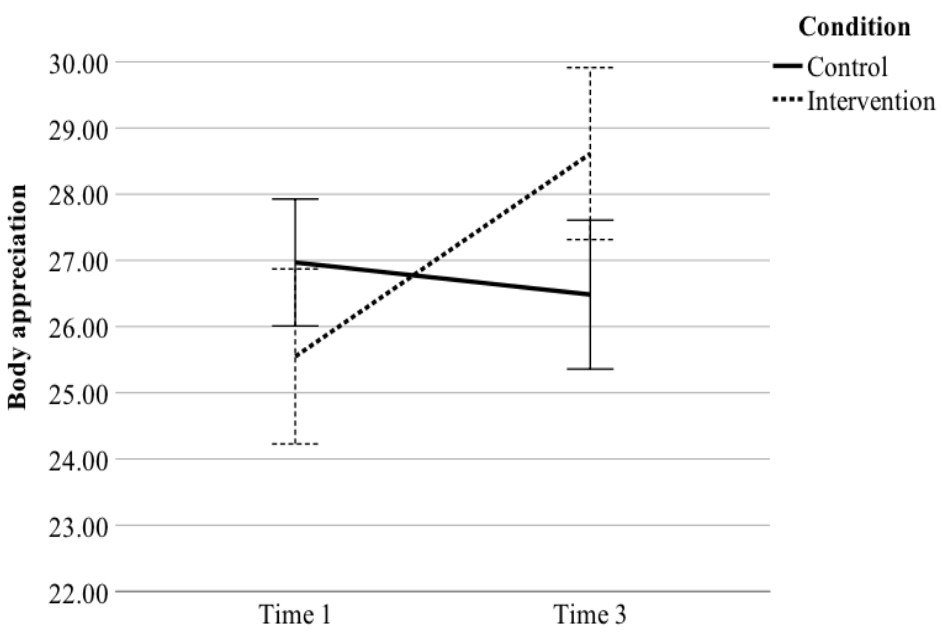
2.3.4 Did the intervention affect scores on the body image variables?

The second question aimed to assess the effect of the intervention on the four body image variables. A series of 2 x 2 (group x time) mixed model ANOVAs were conducted to examine whether scores were significantly different for body appreciation, body satisfaction, thin-ideal internalisation and social body comparisons at the end of the one-week intervention. The two time points that were analysed were at baseline (T1) and immediately after returning to the laboratory

one week later (T3). For body satisfaction there was a significant main effect of time, $F(1,60) = 19.18$, $p < .001$, $\eta p^2 = 0.24$, but not group, $F(1,60) = 0.34$, $p = .56$, $\eta p^2 = 0.006$, and a significant time x group interaction, depicted in Figure 3, $F(1,60) = 9.06$, $p = .004$, $\eta p^2 = 0.13$. For body appreciation there was a significant main effect of time, $F(1,60) = 8.96$, $p = .004$, $\eta p^2 = 0.13$ but not group, $F(1,60) = 0.05$, $p = .83$, $\eta p^2 = 0.001$, and a significant time x group interaction, $F(1,60) = 9.06$, $p < .001$, $\eta p^2 = 0.22$, again presented in Figure 3. In a similar manner, for thin-ideal internalisation, there was a significant main effect of time, $F(1,60) = 5.03$, $p = .03$, $\eta p^2 = 0.08$, but not of group, $F(1,60) = 0.99$, $p = .32$, $\eta p^2 = 0.02$, and the time x group interaction effect was marginally significant, $F(1,60) = 9.06$, $p = .05$, $\eta p^2 = 0.06$. In contrast, for social appearance comparisons, there was a significant main effect of time, $F(1,60) = 8.96$, $p = .004$, $\eta p^2 = 0.13$, but not of group, $F(1,60) = 2.26$, $p = .14$, $\eta p^2 = 0.04$, and the time x group interaction was non-significant as well, $F(1,60) = 1.46$, $p = .23$, $\eta p^2 = 0.02$.

Table 7 reveals the results of the paired samples t-tests indicating that scores significantly improved on body satisfaction, body appreciation and thin-ideal internalisation but not social appearance comparisons in the intervention group, whereas there were no significant differences in the control group between the two time points. In contrast, the independent samples t-tests demonstrate that the significant interactions could not be attributed to any significant differences between scores in body satisfaction, body appreciation and thin-ideal internalisation at baseline.


Condition
Control
Intervention
Body satisfaction
5.50
5.00
4.50
4.00
3.50
3.00
2.50
Time 1
Time 3


Condition
Control
Intervention
Body appreciation
30.00
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Time 1
Time 3

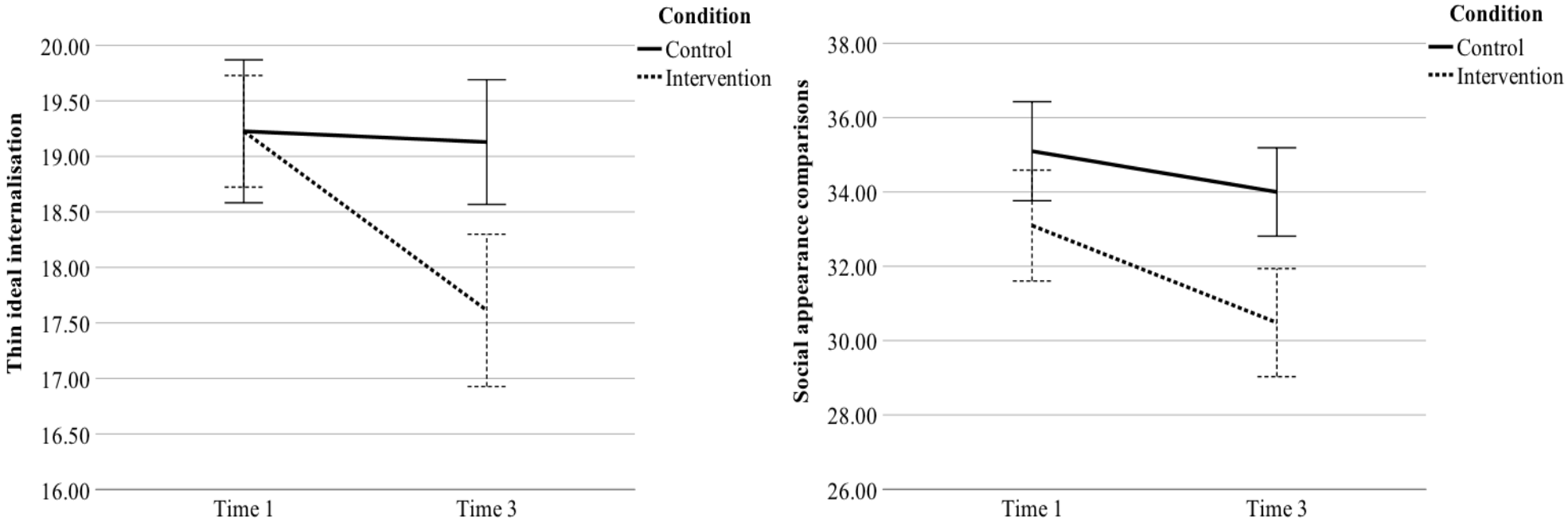


Figure 3. Interactions effects for body satisfaction, body appreciation, thin-ideal internalisation and social appearance comparisons, across T1 and T3 in the intervention and control group. Error bars +/- 1 Standard Error

Table 7

The effects of the intervention on the body image variables

Measure	Time	Intervention (n = 31) Mean (SD)	Control (n = 31) Mean (SD)	Time		Time x Group		T test (Intervention = T3 > T1)			T test (Control = T3 > T1)			T test (T1 intervention ≠ T1 control)			T test (T3 intervention ≠ T3 control)		
				$F(1, 60)$	p	$F(1, 60)$	p	$t(30)$	p	d	$t(30)$	p	d	$t(60)$	p	d	$t(60)$	p	d
BS	T1	3.68 (1.74)	4.29 (1.81)	19.18	<.001*	9.06	.004**	4.46	<.001***	0.80	1.22	.23	0.22	1.36	.18	0.35	0.21	.84	0.05
	T3	4.55 (1.75)	4.45 (1.89)																
BAS	T1	25.55 (7.36)	26.97 (5.34)	8.96	.004**	16.93	<.001***	4.24	<.001***	0.76	1.03	.31	0.18	0.87	.39	0.22	1.23	.22	0.31
	T3	28.62 (7.23)	26.48 (6.26)																
SATAQ-4	T1	19.22 (2.80)	19.22 (3.58)	5.03	.029*	17.82	.051	3.78	.001**	0.68	0.15	.88	0.03	0.00	1.00	0.00	1.71	.09	0.43
	T3	17.61 (3.82)	19.13 (3.13)																
PACS-R	T1	33.10 (8.30)	35.10 (7.42)	8.75	.004**	1.46	.23												
	T3	30.48 (6.62)	34.00 (6.61)																

Note. BS (Body satisfaction), BAS (Body Appreciation Scale), SATAQ-4 (Sociocultural Attitudes Towards Appearance Questionnaire-4), PACS-R (Physical Appearance Comparison Scale Revised)

*Sig .05

**Sig .005

***Sig .0005

2.3.5 Did the letter writing task increase self-compassion or self-esteem and protect against threat?

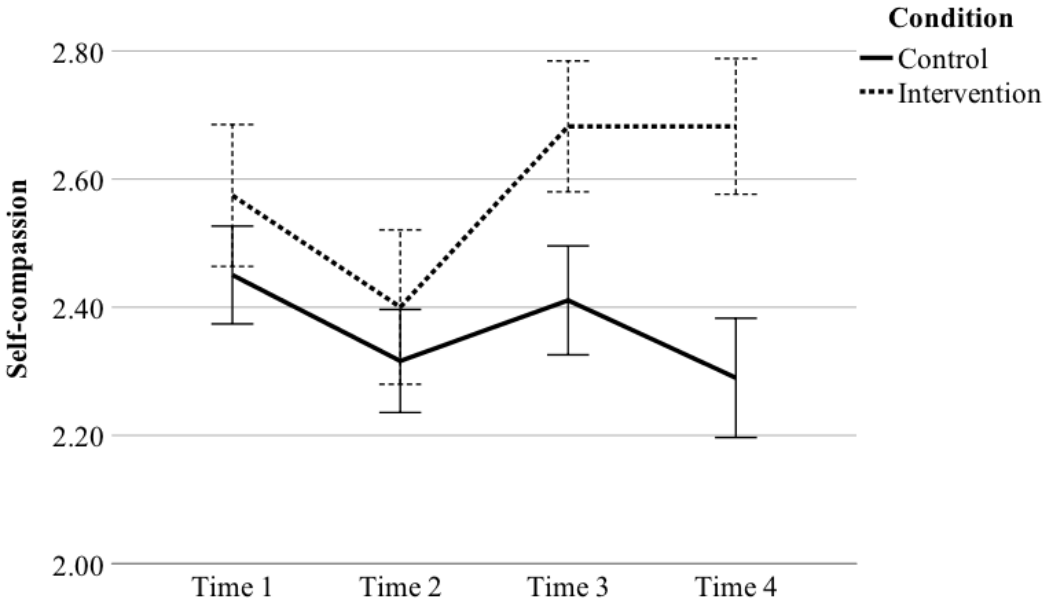
The third question examined whether the self-compassionate letter writing task prompted any changes to scores in the two positive constructs of self; self-compassion and self-esteem. In order to track changes across the intervention, baseline scores (T1) were compared with scores immediately after returning for the second test session (T3). In addition, the difference scores in self-compassion before and after viewing the thin ideals in the first and second test sessions (T2-T1 and T4-T3) were compared between groups. This was to assess whether changes in self-compassion or self-esteem caused by exposure to the thin ideal stimuli, were in any way affected by the self-compassionate letter writing intervention. Figure 4 presents changes in participants' scores in self-compassion and self-esteem across all four time points in the experiment.

Self-compassion. First a 2 x 2 (Group x Time) mixed model ANOVA was carried out to compare scores in self-compassion between groups across the intervention, between T1 and T3. There was no effect of time, $F(1,60) = 0.65$, $p = .42$, $\eta p^2 = 0.01$, or group, $F(1,60) = 2.43$, $p = .12$, $\eta p^2 = 0.04$; and the group x time interaction also failed to reach significance, although there was some indication of a non-significant trend illustrated in Figure 4, $F(1,60) = 3.04$, $p = .09$, $\eta p^2 = 0.05$.

Next, two difference scores were calculated to measure the impact of presenting the thin ideals on self-compassion scores in both test sessions (T2-T1 and T4-T3). These scores were entered into a 2 x 2 (Group x Time) mixed model ANOVA. There was a significant main effect of time, $F(1,60) = 10.20$, $p = .002$, $\eta p^2 = 0.15$, a non-significant main effect of group, $F(1,60) = 1.13$, $p = .29$, , $\eta p^2 = 0.02$, and a significant group x time interaction $F(1,60) = 7.53$, $p = .008$, $\eta p^2 = 0.11$. This interaction is shown in Figure 4. Post hoc t-tests to explore the interaction showed that although the presentation of thin ideals reduced self-compassion scores to the same extent in both groups in the first test session $t(60) = 0.93$, $p = .36$, $d = 0.24$, after the letter-writing intervention task, self-compassion was significantly less affected by the thin ideals in the intervention group than in the control group, $t(60) = 2.30$, $p = .03$, $d = 0.58$. Testament to the effectiveness of the self-compassion intervention was the fact that there was no difference in self-compassion scores before and after looking at the thin ideals at the second session in the intervention group ($M = 2.68$ at T3 and T4).

Self-esteem. A similar 2 x 2 (group x time) mixed model ANOVA was carried out to compare scores in self-esteem between groups across the intervention, between T1 and T3. There was a significant main effect of time, $F(1,60) = 16.20$, $p < .00$, $\eta p^2 = 0.21$, a non-significant main effect of group, $F(1,60) = 1.38$, $p = .25$, $\eta p^2 = 0.02$, and a significant time x group interaction effect, $F(1, 60) = 5.49$, $p = .02$, $\eta p^2 = 0.08$, presented in Figure 4. Paired samples t-test demonstrated that self-esteem significantly increased from the first to the second test session in the intervention group $t(30) = 4.37$, $p < .001$, $d = 0.79$, but not in the control group $t(30) = 1.23$, $p = .229$, $d = 0.22$. However, independent samples t-tests revealed that despite these improvements, there were no significant differences in self-esteem in the intervention and control groups in the first test session $t(60) = 0.65$, $p = .51$, $d = 0.19$, or the second test session, $t(60) = 1.61$, $p = .11$, $d = 0.13$.

As with scores in self-compassion, two difference scores were calculated to measure the impact of presenting the thin ideals on self-esteem scores in both test sessions (T2-T1 and T4-T3). These scores were entered into a 2 x 2 (group x time) mixed model ANOVA, where there was a non-significant main effect of time, $F(1,60) = 1.17$, $p = .28$, $\eta p^2 = 0.02$, a non-significant main effect of group, $F(1,60) = 0.86$, $p = .36$, $\eta p^2 = 0.01$, and a non-significant group x time interaction $F(1,60) = 0.01$, $p = .93$, $\eta p^2 < 0.001$. This indicated that presenting the thin ideals affected scores in self-esteem to the same extent in both test sessions of the experiment, irrespective of group.



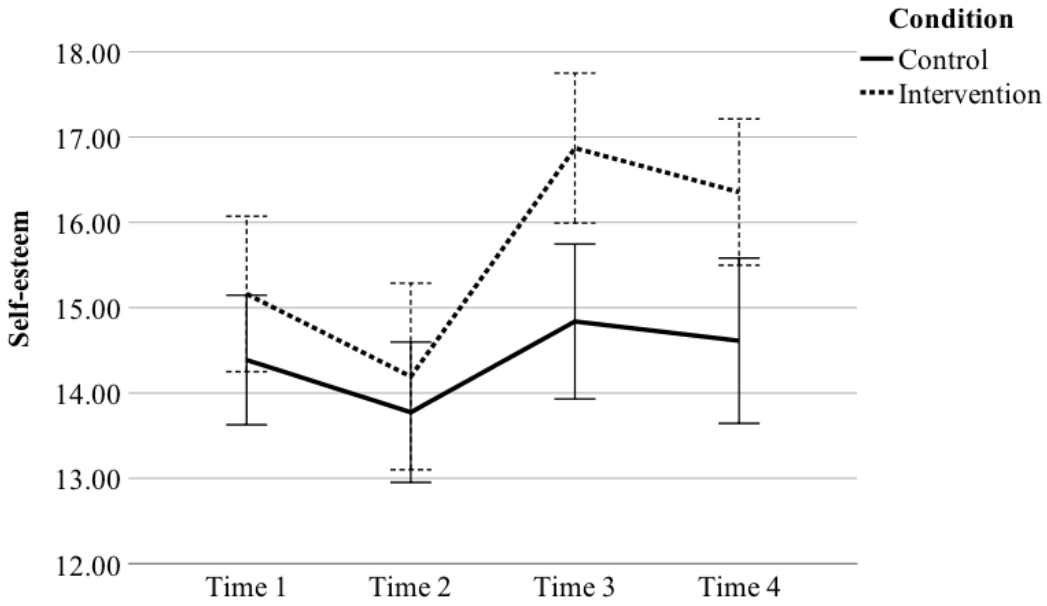


Figure 4. Self-compassion and self-esteem scores across the four time points in the experiment in the intervention and control groups. Error bars +/- 1 Standard Error

A Bivariate Pearson's correlation analysis was conducted to examine whether numbers of days completing the letter writing task was associated with the difference between scores in the dependent variables after viewing the thin ideals in the first and second test sessions. Table 8 illustrates that none of the dependent variables were significantly related to the number of days that participants reported to have completed the task.

Table 8

Pearson's correlations between changes in study outcomes (between T4 and T2) and number of days completing the letter writing task

Outcome		BS	BAS	SATAQ-4	PACS-R
Adherence	*r*	0.15	0.31	0.13	0.01
	p	.41	.10	.50	.98

Note. BS = Body satisfaction, BAS = Body Appreciation Scale, SATAQ-4 = Sociocultural Attitudes Towards Appearance Questionnaire-4, PACS-R = Physical Appearance Comparison Scale Revised

2.3.6 Did the intervention protect against the impact of the thin ideals?

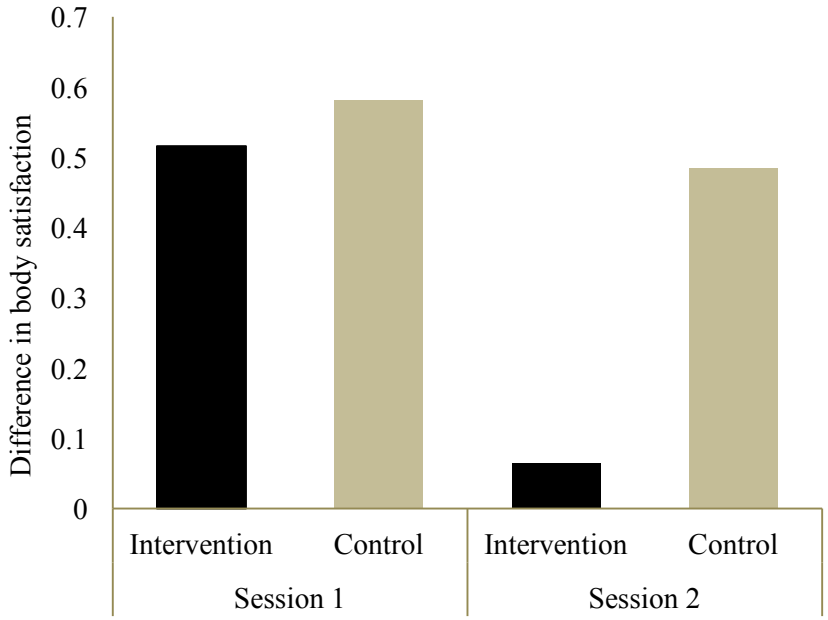
The final question was to assess whether the intervention significantly reduced the impact of presenting the thin-ideal images on the four body image variables. In order to examine this question, two difference scores were calculated to measure the impact of presentation of the thin ideals in both test sessions (T2-T1 and T4-T3). These scores were entered into a series of 2 x 2 (Group x Time) mixed model ANOVAs to test the impact of self-compassion training on body satisfaction, body appreciation, thin-ideal internalisation and social appearance comparisons before and after viewing the thin-ideal slides. The main effects were time (Test session 1 and Test session 2) and group (the intervention and control groups). Figure 5 presents the difference scores for body satisfaction and body appreciation.

For body satisfaction, there was a significant main effect of time, $F(1,60) = 4.21$, $p = .04$, $\eta p^2 = 0.07$, but not of group, $F(1,60) = 1.95$, $p = .17$, $\eta p^2 = 0.03$, and there was no significant group x time interaction, $F(1, 60) = 1.76$, $p = .19$, $\eta p^2 = 0.03$. For the significant main effect of time, the effect of presenting the thin-ideals (i.e. the difference between scores in body satisfaction before and after presenting the images) was significantly lower in the second test session ($M = 0.27$), than in the first test session (M = 0.55), regardless of group.

For body appreciation, there was a significant main effect of time, $F(1,60) = 5.60$, $p = .02$, $\eta p^2 = 0.08$, and group $F(1,60) = 6.40$, $p = .01$, $\eta p^2 = 0.10$, but the group x time interaction was non-significant $F(1,60) = 9.50$, $p = .33$, $\eta p^2 = 0.16$. For the main effect of time, scores in body appreciation were significantly less affected by the thin ideals in the second test session ($M = 0.57$) than the first ($M = 1.66$), irrespective of group. The main effect of group was significant as the intervention group was significantly less affected by the thin ideals ($M = 0.57$), than the control group ($M = 1.66$), regardless of test session.

For thin-ideal internalisation, there was no significant main effect of time, $F(60) = 0.05$, $p = .82$, $\eta p^2 = 0.001$, or group $F(60) = 0.04$, $p = .86$, $\eta p^2 = 0.001$, and there was no significant time x group interaction $F(60) = 0.09$, $p = .77$, $\eta p^2 = 0.001$. The same was the case for social

appearance comparisons where the main effects of time $F(60) = 0.26$, $p = .62$, $\eta p^2 = 0.004$, group $F(60) = 0.02$, $p = .90$, $\eta p^2 < 0.001$, and the group x time interaction $F(60) = 0.20$, $p = .66$, $\eta p^2 = 0.003$, were non-significant. This indicated that there were no significant differences in the extent to which the presentation of the thin ideal images affected scores in thin-ideal internalisation and social appearance comparisons, in both test sessions, irrespective of condition.



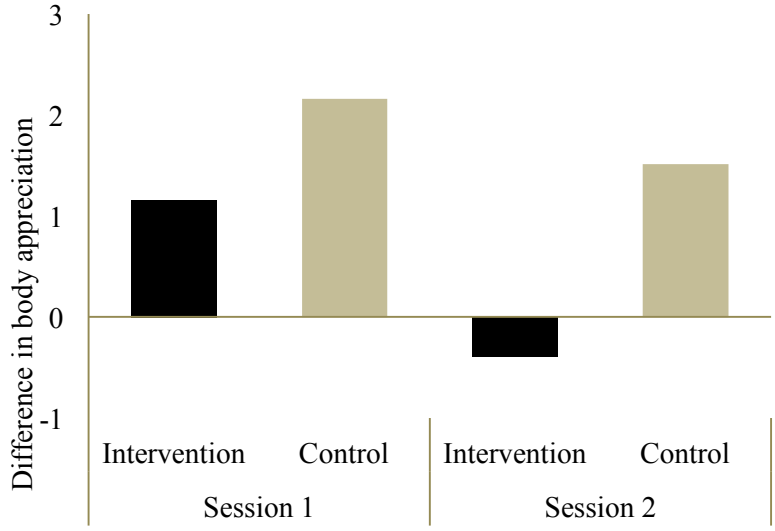


Figure 5. Differences in scores before and after presenting the thin ideal images in the first and second test sessions in body satisfaction and body appreciation in the intervention and control groups

2.4 Discussion

This study aimed to examine the impact of a self-compassionate letter writing intervention on body satisfaction, body appreciation, thin-ideal internalisation and social appearance comparisons, and to assess whether this intervention was protective against exposure to thin ideals, as threatening body image stimuli. As predicted, presentation of the thin ideals in the first test session led to significantly lower body satisfaction and body appreciation, and significantly higher social appearance comparisons, in both groups. In line with the second hypothesis, scores in body satisfaction and body appreciation significantly increased and thin-ideal internalisation significantly reduced, but against the third hypothesis, significant improvements were observed in self-esteem and not self-compassion, following the intervention. Contrary to hypothesis, the intervention did not protect scores on any of the study variables against presentation of the thin ideals, significantly more than what was observed in the control group.

2.4.1 The impact of the thin ideals

The presentation of the thin ideals prompted significant reductions in body satisfaction and body appreciation, and significant increases in social appearance comparisons, suggesting that the images successfully activated the participants' threat systems. In keeping with the existing literature, it is possible that attending to the thin ideals triggered the process of upward appearance comparisons which might have highlighted unfavourable discrepancies between their bodies and the bodies of the fashion models, which may have in turn reduced body satisfaction and body appreciation (Blond, 2008; Grabe et al., 2008). Surprisingly, thin-ideal internalisation did not change in either group, possibly because this variable was already high at baseline. With this in mind, participants may have been more vulnerable to the impact of comparing their bodies to the thin ideals, due to valuing thinness highly from the outset, which may have ultimately facilitated greater reductions in body satisfaction and body appreciation after viewing the thin ideals.

2.4.2 The impact of the intervention on eating disorder concerns

After the intervention, scores in all of the study variables, other than social appearance comparisons significantly improved from baseline, in the intervention group only. This suggests that the letter writing task was responsible for prompting a significant reduction in thin-ideal internalisation and increases body satisfaction and body appreciation. These findings support previous trials where a self-compassionate intervention has facilitated improvements in body

satisfaction and body appreciation (Albertson et al., 2014, Seekis et al., 2017). To date, only a correlational relationship has been documented between higher self-compassion and lower thin-ideal internalisation (Tylka et al; 2015), and so the current findings further reinforce this association. However, alpha values were low for participants' scores in thin-ideal internalisation at baseline, and so these interpretations should be viewed with caution. The finding that social appearance comparisons did not improve after the intervention was seemingly inconsistent with outcomes from previous studies where higher self-compassion has been associated with lower social appearance comparisons (Neff & Vonk, 2009). Furthermore, this finding did not cohere with the significant improvements in the other body image variables in the current study. One possible explanation for this is that rather than reducing the number of social appearance comparisons, the intervention moderated the impact of these, perhaps by encouraging participants to focus less on harsh discrepancies between their own bodies and other people's (Homan & Tylka, 2015). Furthermore, as the questionnaire used to measure social appearance comparisons only assessed the frequency and not the quality of overall appearance comparisons, it is possible that these incorporated at least some objective and realistic body comparisons.

2.4.3 Was self-compassion the active component in the intervention?

There were no significant improvements in scores in self-compassion in the intervention or control groups, immediately after returning back for the second test session following the intervention. However, whilst self-compassion levels decreased in both the intervention and control groups in the first test session following exposing to the thin-ideals (and in the control group in the second test session), the intervention group reported consistently high levels of self-compassion even following exposure to the thin ideals in the second test session. Given that self-compassion is supposed to be drawn upon in threatening situations (Gilbert, 2005) it makes sense that significant changes in the participants' levels of self-compassion were more prominent in response to the thin ideals, following the letter-writing intervention. These findings are also consistent with the notion that individuals with eating disorder concerns tend to struggle to generate self-compassion in times of threat (Goss & Allan, 2010). The self-compassionate intervention seemingly moderated this effect, with similar results for both the positive and negative dimensions of self-compassion (Lopez, 2015), whereby participants reported both an increase in self-compassion and reduction in self-criticism. This was a key finding given that high levels of self-criticism have been shown to interfere with treatment for people with eating disorders (Kelly et al., 2013). These outcomes occurred after the intervention group completed the letter writing task for the final time, and so it is unclear whether consistently high scores in self-compassion were due to a cumulative effect or reactive to the most recent exercise attempt. Intervention adherence was not associated with better

outcomes, possibly because all participants reported having completed the task on at least four days out of a total six.

Against prediction, self-esteem significantly improved in the intervention group immediately after returning for the second test session (T3) compared to baseline (T1), although self-esteem was still not significantly higher in the intervention group than the control group in the second test session. This suggests that the intervention did not uniquely target self-compassion and that subsequent changes in the body image variables may have been led by a greater positive attitude towards the self based on perceived competence in valued domains (i.e. self-esteem; James, 1890) rather than an unconditional positive attitude towards the self, even in light of personal shortcomings and failures (i.e. self-compassion; Neff, 2003). It is interesting that self-esteem improved to such a degree, given that the letter writing task drew participants' attention to a recent personal shortcoming or failure. It is possible that in taking on the perspective of a close significant other, participants were able to remind themselves of more positive personal qualities which may have boosted self-esteem. Of course, improvements in self-esteem resulting from the intervention were not protected in the same way as scores in self-compassion following presenting of the thin ideals in the second test-session. This finding was as expected considering that self-esteem is contingent on evaluations of self-worth in important life domains (Neff & Vonk, 2009) such as appearance, and the thin ideals may have triggered downward self evaluations. As the Rosenberg Self-esteem Scale has previously been criticized for eliciting response bias (Marsh, Scalas & Nagengast, 2010), future research should include additional measures of self-compassion and self-esteem to corroborate these findings.

2.4.4 The impact of the intervention on exposure to thin ideals

Again, contrary to hypothesis, scores in body satisfaction and body appreciation were significantly less affected by the presentation of the thin ideals in the second test session in both the intervention group and the control group. This implies that the self-compassionate intervention did not significantly offset the impact of the thin ideals any more than repeated exposure to the images. This was an interesting finding, given that self-compassion was consistently high in the intervention group following exposure to the thin-ideals in the second test session. Since improvements were seen in changes to body satisfaction and body appreciation in both groups, one explanation for this could be that all participants habituated to the effect of viewing the thin ideals images, which meant that these were less threatening in the second test session, which may have overshadowed the effects of the self-compassionate intervention. Future research should aim to activate threat using two distinct but equivalent tasks in order to prevent such exposure effects.

2.4.5 Study strengths

This study was the first to examine the impact of a brief self-compassion intervention on body image as well as two of the key risk factors involved in the development and maintenance of eating disorders. Using an experimental design helped to support existing correlational data suggesting that self-compassion protects against thin-ideal internalisation (Homan & Tylka, 2015) and poor body image resulting from this. Selecting participants with eating disorder concerns and presenting the thin ideals meant that a context was set up which triggered low body satisfaction and body appreciation before the intervention was introduced, thus closer resembling a clinical sample and increasing clinical relevance. Compared with previous self-compassionate intervention studies (e.g. Albertson et al., 2014; Pinto-Gouveia et al., 2017) adherence was reportedly very high, and at the end of the experiment, participants commented that the task was easily integrated into their week, since it didn't take too long to complete and because they were able to flexibly formulate their letters on a portable device and/or scrap paper. Participants also commented on finding the reminder email helpful as a prompt to complete the task, especially since they had scheduled this to be received at a time of day which was convenient for them. This task may therefore translate well in a clinical setting, when teaching patients with eating disorders to exhibit greater self-compassion as well as greater self-esteem.

2.4.6 Limitations

As in any research design, there were several limitations to the current study. First, the brief duration of the intervention may have obscured its full potential. Had participants been able to practice the task for longer, they might have achieved significantly higher levels of self-compassion, and the body image variables may have shown greater improvements as well. Furthermore, no follow-up data was collected to examine whether the significant outcomes that were obtained were sustainable. Although the task seemingly increased body satisfaction and appreciation and reduced thin-ideal internalisation, it is unclear whether and how often participants would need to use the exercise to maintain this, and whether they would be motivated to do so. Another limitation was that since there was no active control group, it is not possible to rule out the possibility that the outcomes observed were due to a placebo effect, whereby the intervention group was aware that they were doing something positive for themselves. However, the control group might have also anticipated that their scores were expected to change and these of course did not, so it is possible that the letter writing intervention was beneficial and it is worthwhile for further studies to be conducted which compare this to other established interventions. In particular, it

might be helpful to compare a similar self-compassionate letter writing task, to an equivalent version which guides the participant through traditional cognitive challenging.

A further limitation was that, although participants were asked to report how many days they completed the task, they were not asked to provide additional evidence of their letters, since they may have felt more inhibited in their writing, if they were asked to share this. However, this meant that it was not possible to verify that the task had in fact been completed or that the tone of the letters was sufficiently warm (Gilbert, 2009). Moreover, although a high proportion of the participants were evidently affected by the thin ideal images, during the final debrief some of the participants commented that they thought it was unrealistic to critically compare themselves to "airbrushed" images of supermodels, which may have contributed to their reduced impact in the second test session. Recent research has suggested that women might be more likely to compare themselves to other females on social media, since they report having a deeper connection with these individuals (Brown & Tiggeman, 2016). Future trials should test the impact of the letter writing intervention on body image following exposure to different types of thin ideal images including ones which are edited and filtered on social media sites.

2.4.7 Conclusion

In conclusion, this study suggests that self-compassionate letter writing can support women to feel more satisfied and appreciative of their bodies, even when presented with images of women representing the Western ideal for thinness. The intervention also led to significant improvements in thin-ideal internalisation, indicating that the intervention may have operated through this prominent risk factor for eating disorder symptomology, although it is unclear whether an increase in self-compassion or self-esteem were the primary mechanisms for change. Self-compassion based interventions, like the one used in this trial may help to not only alleviate body dissatisfaction, but also challenge the underlying thin ideal and protect against threatening body image stimuli. Further research is warranted to fully understand the role that self-compassion based interventions might play in protecting against threatening body image stimuli. Moreover, in order to establish the full clinical potential of self-compassion based interventions, including letter writing, these should be researched in longer trials with active control groups.

Appendix A Quality assessment

	Selection bias		Performance bias		Detection bias		Attrition bias (>20%)		Reporting bias	
Study	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**
Adams & Leary (2007)	Unclear	Randomisation method not stated	Low risk	Blinding of ps but not personnel. Unlikely that outcomes were influenced by lack of blinding	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	Low	No dropouts, no other exclusions reported	High	Incomplete or absent reporting of some outcomes and not others on the basis of the results
Albertson et al., (2014)	Low risk	Randomisation method unclear but no sig difs in baseline or demographic variables	High	Lack of blinding for ps may have influenced behaviour in intervention	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	High	52% overall Intervention = 60% Control = 46%	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Duarte, et al., (2017)	Unclear	Randomisation method not stated	High	Lack of blinding for ps may have influenced behaviour in intervention	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	High	39% overall Intervention = 35% Control = 44%	High	Incomplete or absent reporting of some outcomes and not others on the basis of the results
Karpiak et al., (2015)	Low risk	Condition assigned by random distribution of questionnaire packets with one of three readings	Low	Nature of tasks meant that unlikely that ps behaviour was influenced by lack of blinding	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	Low	None reported	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported

Appendix A

	Selection bias		Performance bias		Detection bias		Attrition bias (>20%)		Reporting bias	
Study	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**
Kelly et al., (2015)	Low risk	Random number generator assigned condition in lab	Low	Ps were not blind to condition assigned to but credibility scores did not differ across conditions	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	High	15% overall 27% = SC group 8% = Behaviour group 8% = Control	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Kelly, et al., (2017)	Low risk	Research coordinator asked ps to blindly pull one of two pieces of paper out of cup	Low	Nature of tasks meant that unlikely that ps behaviour was influenced by lack of blinding	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	Low	23% overall 18% = Intervention 27% = Control	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Loader et al., (2013)	Low risk	Random number generator assigned p to condition	High	Lack of blinding for ps may have influenced behaviour in intervention	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	Low	50% overall (including outliers) Dropouts = 44% Intention to treat analyses used	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported

	Selection bias		Performance bias		Detection bias		Attrition bias (>20%)		Reporting bias	
Study	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**
Mantzios et al., (2014)	Unclear	Randomisation method not stated	Low	Both interventions closely matched. Ps not aware of condition assigned to	Low	Personnel blind to outcome measurement	Unclear	47% overall (Unclear ratios for different conditions)	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Mantzios et al., (2014)	Unclear	Randomisation method not stated	Low	Both interventions closely matched. Ps not aware of condition assigned to	Low	Personnel blind to outcome measurement	Low	21% = SC diaries 18% = meditation	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Mantzios et al., (2015)	Unclear	Randomization method not clear, No sig difs between the groups for demographic variables	Low	Two/three of the interventions were well matched	Low	Personnel blind to outcome measurement	Low	28% overall 51.7% = SC 34.5% = MM 0% = control	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Murn, 2008	Unclear	Randomisation method not stated	Unclear	Insufficient information to permit judgement of 'Low risk' or 'High risk'	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	Low	None during intervention. Only 2 ps attended FU	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported

Appendix A

	Selection bias		Performance bias		Detection bias		Attrition bias (>20%)		Reporting bias	
Study	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**
Palmeira, et al., 2017	Low risk	Computerised randomization	High	Lack of blinding for ps may have influenced behaviour in intervention	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	Low	19% overall Intervention = 25%. Control = 14% Intention to treat analyses used	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Rodgers et al., (2018)	Low risk	Randomisation using a randomization schedule whereby ps informed of group assigned to via email	High	Lack of blinding for ps may have influenced behaviour in intervention	Unclear	Insufficient information to permit judgement of 'Low risk' or 'High risk'	Low	14% didn't complete post-test	Unclear	Non-significant results clearly reported, but improvements in control group were no explored in discussion
Seekis et al., (2017)	Low risk	Ps issued with a paper dot printed in one of three colours denoting each condition and asked to choose a seat where a booklet with a corresponding coloured dot was placed	Low	Nature of tasks meant that unlikely that ps behaviour was influenced by lack of blinding	Unclear	Insufficient information to permit judgement of 'Low risk' or 'High risk'	Low	None but 8% didn't return questionnaires at follow-up	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported

	Selection bias		Performance bias		Detection bias		Attrition bias (>20%)		Reporting bias	
Study	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**
Seo (2016)	Low risk	Computerised randomisation (Qualtrics)	Low	Condition allocated by automated email Interventions well matched	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	High	83% (cohort 1) 83% (cohort 2) 34% (cohort 3) Only 9 ps completed FU	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Slater et al., (2017)	Low risk	Restricted randomisation with minimisation to ensure moderately equal cell sizes	Low	Nature of tasks meant that unlikely that ps behaviour was influenced by lack of blinding	Unclear	Insufficient information to permit judgement of 'Low risk' or 'High risk'	Low	None	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Toole et al., (2017)	Unclear	Randomisation method not stated	High	Lack of blinding for ps may have influenced behaviour in intervention	Low	Personnel blind to outcome measurement	Low	4.6% overall Intervention = 8% Control = 3%	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported

Appendix A

	Selection and confound bias		Bias in classification of interventions/ Deviations from intervention		Detection bias		Attrition bias (>20%)		Reporting bias	
Study	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**
Altman et al, (2017)	High	Therapeutic gains prior to compassion based intervention may have been a confounding factor	High	Combination of interventions used	High	High scores post-treatment when therapy ending	Low	No missing data	High	Statistics not reported
Braun, et al., (2012)	High risk	Participants self-selected into the program	High	Combination of interventions used	Unclear	Not clear as to who managed outcomes	Low	16% by post-intervention 51% at 3m FU 49% at 1year FU	High	Incomplete or absent reporting of some outcomes and not others on the basis of the results
Braun, et al., (2016)	High risk	Participants self-selected into the program	High	Combination of interventions used	Unclear	Not clear as to who managed outcomes	Low	Study 1: 18.2% Study 2: 28.6%	High	Incomplete or absent reporting of some outcomes and not others on the basis of the results
Gale et al.., (2014)	Unclear	Insufficient information to permit judgement of 'Low risk' or 'High risk'	High	Combination of interventions used	Low	Outcomes taken when group was not originally set up as a research trial	Low	43% overall. 27% (didn't complete final questionnaires)	Low	Acknowledged that large SDs and missing data might affect data interpretation

	Selection and confound bias		Bias in classification of interventions/ Deviations from intervention		Detection bias		Attrition bias (>20%)		Reporting bias	
Study	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**	**Author's judgment**	**Support for judgment**
Hopkins (2017)	Low risk	Selection based on participant characteristics observed before the start of intervention	Low	No deviation from intervention	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	Low	56 participants chose not to proceed with the study after screening	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Pinto-Gouveia et al., (2016)	Low risk	Selection based on participant characteristics observed before the start of intervention	High	Combination of interventions used	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	High	42% (only intervention group)	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Pinto-Gouveia et al., (2017)	Low risk	Allocation to condition dependent on whether ps could attend group, but no sig difs between groups for demographic variables	High	Combination of models used	Low	No blinding of outcome assessment, but unlikely to have influenced outcome measurement	High	39% overall Intervention = 44% Control = 38%	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported
Williams et al., (2017)	High	Intervention offered to those patients who considered CFT to be an acceptable approach	High	Combination of interventions used, and to a varying degree No formalised checks regarding therapist adherence to CFT	Low	Outcomes taken before research trial was set up	Low	No missing data	Low	Study protocol was clear and all of the study's pre-specified outcomes were reported

Note. Quality assessment based on The Quality assessment tool for quantitative studies (Effective Public Health Practice Project, 1998), The Cochrane Collaboration's tool for assessing risk of bias in randomised trials (Higgins et al., 2011), The Risk Of Bias In Non-randomized Studies of Interventions (ROBINS-I; Sterne et al., 2016). Sig = significant, diffs = differences, ps = participants

Appendix B Study poster

How do you feel about your body?

Are you female and aged between 18-65?
If so, I am interested in hearing from you.

We are recruiting volunteers to take part in one of two research studies investigating the influence of different factors (such as mental imagery and self-compassion) on attitudes towards the self and body image.

Participation involves you first completing an online questionnaire. This should take no longer than 15 minutes.

If you score within the range we are interested in, you will be emailed by one of the researchers and invited to meet them for two sessions at the university, lasting between one and two hours at a time and spread out by a week.

You might also be required to complete a 30-minute task, every day, in between sessions.

PAYMENT: You will receive either course credits or direct debit payment for participating in the phases of the study which take place after completing the initial online questionnaire.

For those eligible to take part in the study, 3 credits/£1.50 will be given for every 15 minutes spent completing the study (including time spent completing the task away from the university).

If you are interested please complete the online questionnaire, which can be accessed on the following web address (also on the tear off slips below):

https://www.isurvey.soton.ac.uk/23308

Or contact us on il1g15@soton.ac.uk or klb1e12@soton.ac.uk if you would like the link forwarded to your email address.

If you would like further information please contact il1g15@soton.ac.uk or klb1e12@soton.ac.uk to request a copy of the information sheet.

Appendix C Consent form

CONSENT FORM (Version 3, 20.03.17)

Study title: Investigating body image following difficult events and personal shortcomings

Researchers: Isabel Lewis (Trainee Clinical Psychologist)
Kate Bramwell (Trainee Clinical Psychologist)

Supervisors: Prof Lusia Stopa (Research and Clinical Psychologist)
Dr Hannah Turner (Clinical Psychologist)

Ergo Study number: 25463

Please initial the box(es) if you agree with the statement(s):

I have read and understood the participant information sheet (20.03.17/Version 3) for the above study. I have had the opportunity to consider the information and ask questions about the study.	☐
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	☐
I understand my participation is entirely voluntary and I may withdraw at any time without giving any reason, without any consequence.	☐

Name of participant (print name)……

Signature of participant……..

Date……

Appendix D Participant Information Sheet: Intervention Group

Participant Information Sheet (Version 3, 20.03.17)

Study: Investigating body image following difficult events and personal shortcomings

Researchers: Isabel Lewis (Trainee Clinical Psychologist)

Kate Bramwell (Trainee Clinical Psychologist)

Supervisors: Prof Lusia Stopa (Research and Clinical Psychologist)

Dr Hannah Turner (Clinical Psychologist)

Ergo Study number: 25463

You are being invited to take part in a research study at The University of Southampton. Before deciding whether to take part it is important that you understand why the study is being carried out and what it will entail.

Please read this information carefully, it will explain what the study is about and what you will be asked to do if you decide to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

The study aims to investigate how an individual's body image might be affected by how they treat themselves during and after difficult events and personal shortcomings. This topic is a relatively new area of research and therefore, it is hoped that the findings of this study will develop current psychological theory and inform future interventions for clinical populations.

Why have I been chosen?

You have been invited to take part in this research because you scored within the range we are interested in on the online questionnaire.

What will happen to me if I take part?

If you agree to take part in this study it will take approximately two and a half hours in total. This will consist of forty five minutes for the first experimental session, forty-five minutes for the follow up session, one week later, and ten minutes each day, in between (away from the university). Initially, you will be asked to complete a series of paper-based questionnaires and a demographic information sheet which asks for your age. You will then be asked to view a brief slideshow of photographs of celebrities, which you may or may not recognise from the media.

You will then take part in a letter writing task. This will involve the researcher asking you to write a letter to yourself from the perspective of a close friend. The researcher's instructions will be audio-recorded for quality control purposes.

You will then be asked to complete the same questionnaires you completed prior to viewing the slideshow of images. One week later, you will return to the university to repeat the same procedure,

and following this you will receive a verbal and written debrief from the researcher about the study, and will have an opportunity to ask any questions.

For the week in between, you will be asked to complete the same task for no longer than 10 minutes each day. You will be given written instructions and sent an email reminder, with instructions as well.

Are there any benefits to me taking part?

Other than receiving course credits (12 credits/hour) or payment (£6/hour) for the second part of the study (following the initial screening questionnaire), there are no personal benefits to you taking part in this study. However, this research hopes to improve our understanding of how an individual's body image might be affected by how they treat themselves during and after difficult events and personal shortcomings. It is also hoped that the findings of this study will inform the development of psychological interventions for clinical populations.

Will I receive payment?

You will receive the advertised credits/payment for completing this study (we cannot unfortunately offer payment for time taken to complete the initial screening questionnaire). If you decide not to complete all of the study, you will still receive credits/payment for the parts you completed.

Are there any risks involved?

There are no foreseeable risks involved in taking part in this study. However, if you feel upset after observing the celebrity images or answering the questionnaires, the researcher will be available to talk to you at the end of the session. If you are struggling with the letter writing task at any point during the week, you can also contact the researcher for support, via email. The debrief information will also contain details of how to access further support if you have any concerns about your body image.

Will my participation be confidential?

The study is carried out in accordance with the Data Protection Act. Therefore, any written reporting of the findings will not include your name or any other identifying characteristics. Data from the questionnaires you complete will be anonymised and stored in a locked cabinet. You will be assigned an individual numerical ID code when data is entered into the computer database, this will ensure confidentially and the database will be kept on a password protected computer.

What happens if I change my mind?

Your participation in this research is entirely voluntary and you may withdraw your data from the study without giving any reason at any time, without your legal rights being affected. There will be no consequences for withdrawing your data and you will still receive the credits/money you earned.

What happens if something goes wrong?

If you have any concerns about your rights as a participant in this study or if you feel you have been placed at risk, please contact: Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)23 8059 3856, email fshs-rso@soton.ac.uk

Where can I get more information?

If you have any further questions about this study please contact Isabel Lewis (Trainee Clinical Psychologist) at il1g15@soton.ac.uk

Thank you for reading the above information. If you are willing to participate in this study please complete and sign the consent form.

Appendix E Participant Information Sheet: Control Group

Participant Information Sheet (Version 3, 20.03.17)

Study: Investigating body image following difficult events and personal shortcomings

Researchers: Isabel Lewis (Trainee Clinical Psychologist)

Kate Bramwell (Trainee Clinical Psychologist)

Supervisors: Prof Lusia Stopa (Research and Clinical Psychologist)

Dr Hannah Turner (Clinical Psychologist)

Ergo Study number: 25463

You are being invited to take part in a research study at The University of Southampton. Before deciding whether to take part it is important that you understand why the study is being carried out and what it will entail.

Please read this information carefully, it will explain what the study is about and what you will be asked to do if you decide to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

The study aims to investigate how an individual's body image might be affected by how they treat themselves during and after difficult events and personal shortcomings. This topic is a relatively new area of research and therefore, it is hoped that the findings of this study will develop current psychological theory and inform future interventions for clinical populations.

Why have I been chosen?

You have been invited to take part in this research because you scored within the range we are interested in on the online questionnaire.

What will happen to me if I take part?

If you agree to take part in this study it will take up to one hour and a half in total. This will consist of forty five minutes for the first experimental session and forty five minutes for the follow up session one week later. Initially, you will be asked to complete a series of paper-based questionnaires and a demographic information sheet which asks for your age. You will then be asked to view a brief slideshow of photographs of celebrities, which you may or may not recognise from the media.

You will then be asked to complete the same questionnaires you completed prior to viewing the slideshow of images. One week later, you will return to the university to repeat the same procedure, and following this you will receive a verbal and written debrief from the researcher about the study, and will have an opportunity to ask any questions.

Are there any benefits to me taking part?

Other than receiving course credits (12 credits/hour) or payment (£6/hour), for the second part of the study (following the initial screening questionnaire), there are no personal benefits to you taking part

in this study. However, this research hopes to improve our understanding of how an individual's body image might be affected by how they treat themselves during and after difficult events and personal shortcomings. It is also hoped that the findings of this study will inform the development of psychological interventions for clinical populations.

Will I receive payment?

You will receive the advertised credits/payment for completing this study, starting from today (we cannot unfortunately offer payment for time taken to complete the initial screening questionnaire). If you decide not to complete all of the study, you will still receive credits/payment for the parts you completed.

Are there any risks involved?

There are no foreseeable risks involved in taking part in this study. However, if you feel upset after observing the celebrity images or answering the questionnaires, the researcher will be available to talk to you at the end of the session. The debrief information will also contain details of how to access further support if you have any concerns about your body shape or weight.

Will my participation be confidential?

The study is carried out in accordance with the Data Protection Act. Therefore, any written reporting of the findings will not include your name or any other identifying characteristics. Data from the questionnaires you complete will be anonymised and stored in a locked cabinet. You will be assigned an individual numerical ID code when data is entered into the computer database, this will ensure confidentially and the database will be kept on a password protected computer.

What happens if I change my mind?

Your participation in this research is entirely voluntary and you may withdraw your data from the study without giving any reason at any time, without your legal rights being affected. There will be no consequences for withdrawing your data and you will still receive the credits/money you earned.

What happens if something goes wrong?

If you have any concerns about your rights as a participant in this study or if you feel you have been placed at risk, please contact:

Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)23 8059 3856, email fshs-rso@soton.ac.uk

Where can I get more information?

If you have any further questions about this study please contact Isabel Lewis (Trainee Clinical Psychologist) at il1g15@soton.ac.uk

Thank you for reading the above information.

If you are willing to participate in this study please complete and sign the consent form.

Appendix F Debrief Statement

Debref Statement (Version 3, 20.03.17)
Can self-compassionate letter writing counteract the impact of thin ideals on body image?

Thank you for participating in this research study.

The aim of the study was to investigate the impact of self-compassion training on body dissatisfaction and risk factors associated with this. We were particularly interested in exposing participants to images of celebrities that epitomize the Western ideal for thinness to observe whether training in self-compassion could protect against the activation of thin-ideals and social body comparisons.

Based on the results of previous research we expect to find that, at the beginning of the experiment, scores in body dissatisfaction, thin-ideal internalisation and social body comparisons will be higher for all participants after viewing a series of photographs of women depicting traditional Western "thin ideals", and lower for body appreciation. For individuals who are trained in self-compassion, it is expected that the difference between scores in these measures, before and after viewing the thin-deal images will be lower, after these participants have engaged in one week of self-compassion training.

In comparison, we expect to find that individuals who are not trained in self-compassion to continue to experience higher levels of thin-ideal internalisation and social body comparisons, after the images have been presented. We anticipate that this will be consistent across both weeks. For those who are not trained in self-compassion, it is further expected that scores in body dissatisfaction might also increase on both experimental trials, and scores in body appreciation are expected to show the reverse effect.

We anticipate these findings because the results of previous research studies have shown that individuals who report concerns about their body shape and weight are more susceptible to thin-ideal internalisation and social body comparisons. Moreover, there is evidence to suggest that these individuals exhibit consistently low levels of self-compassion whereas individuals with high levels of self-compassion indicate lower body dissatisfaction, thin ideal internalisation and social body comparisons, and higher body appreciation.

Your data will provide us with information that will further inform our understanding of the impact of self-compassion on body dissatisfaction and factors influencing this. We hope that the results of this study will also inform future psychological interventions for clinical populations. If you are interested in this area of research and are keen to read more about the previous studies conducted, please see the references at the end of this statement.

Once again, I would like to assure you that the results of this study will not include your name or any other identifying characteristics and that this study did not use any form of deception.

If you have any concerns about your body image or anything else mentioned in the study, please contact:

Steps 2 Wellbeing on 0800 612 7000 or visit http://www.steps2wellbeing.co.uk/ for further information. Steps 2 wellbeing is a free, confidential NHS service for people aged 18 years and over. The service offers a range of different types of treatment for people experiencing problems with low mood/depression, anxiety or stress and you are able to self-refer to the service.

Appendix F

If you have any concerns about your eating, body shape or weight please contact your GP to discuss a potential referral to your local Eating Disorders Service:

April House
9 Bath Road
Bitterne
Southampton
SO19 5ES

Tel No.: 023 8081 9000

April House is an Eating Disorders Service which provides support to individuals over 18 who have an eating disorder. I have attached April House's leaflet to this statement which provides further information and details on how to access the service.

Furthermore, the beat website (b-eat.co.uk) is a good resource for people who have concerns related to eating disorders. It provides details of helplines individuals can contact as well as online support and self-help groups to support adults to overcome their difficulties.
If you have any further questions or would like to see a summary of the results please contact Isabel Lewis (Trainee Clinical Psychologist): il1g15@soton.ac.uk
If you would like to see a copy of the final report this will be available from August 2018.

If you have any concerns about your rights as a participant in this research, or if you feel you have been placed at risk, please contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)23 8059 3856, email fshs-rso@soton.ac.uk

Thank you again for your participation in this study.

Isabel Lewis **Kate Bramwell**

Further reading:

Albertson, E. R., Neff, K. D., & Dill-Shackleford, K. E. (2015). Self-compassion and body dissatisfaction in women: A randomized controlled trial of a brief meditation intervention. *Mindfulness*, *6*(3), 444-454.

Homan, K. J., & Tylka, T. L. (2015). Self-compassion moderates body comparison and appearance self-worth's inverse relationships with body appreciation. *Body image*, *15*, 1-7.

Appendix G Demographic Information From

Directions: Please provide a response for each of the following questions:

1. What is your age? _____

2. What is you sex?

Female ○ Male ○

3. What do you identify as your ethnicity?

White
○ British
○ Irish
○ Other: _____

Black
○African
○ Caribbean
○ Other: _____

Mixed/multiple ethnic groups
○ White and Black Caribbean
○ White and Black African
○ White and Asian
○ Other: _____

Asian/Asian British
○ Indian
○ Pakistani
○ Bangladeshi
○ Chinese
○ Other: _____

Other ethnic group
○ Arab
○ Other: _____

Appendix H Self-Compassion Scale

T1/T2/T3/T4 (researcher circle as appropriate)

Participant number ……

Directions: Please read each statement carefully before answering.

To the right of each item, indicate how often you behave in the stated manner, using the following scale:

Almost Never **1** **2** **3** **4** **Almost Always** **5**	**Score (1-5)**
1. I'm disapproving and judgmental about my own flaws and inadequacies	
2. When I'm feeling down I tend to obsess and fixate on everything that's wrong	
3. When things are going badly for me, I see the difficulties as part of life that everyone goes through	
4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world	
5. I try to be loving towards myself when I'm feeling emotional pain	
6. When I fail at something important to me I become consumed by feelings of inadequacy	
7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am	
8. When times are really difficult, I tend to be tough on myself	
9. When something upsets me I try to keep my emotions in balance	
10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people	
11. I'm intolerant and impatient towards those aspects of my personality I don't like	
12. When I'm going through a very hard time, I give myself the caring and tenderness I need	
13. When I'm feeling down, I tend to feel like most other people are probably happier than I am	
14. When something painful happens I try to take a balanced view of the situation	
15. I try to see my failings as part of the human condition	
16. When I see aspects of myself that I don't like, I get down on myself	
17. When I fail at something important to me I try to keep things in perspective	
18. When I'm really struggling, I tend to feel like other people must be having an easier time of it	
19. I'm kind to myself when I'm experiencing suffering	
20. When something upsets me I get carried away with my feelings	
21. I can be a bit cold-hearted towards myself when I'm experiencing suffering	
22. When I'm feeling down I try to approach my feelings with curiosity and openness	
23. I'm tolerant of my own flaws and inadequacies	
24. When something painful happens I tend to blow the incident out of proportion	
25. When I fail at something that's important to me, I tend to feel alone in my failure	
26. I try to be understanding and patient towards those aspects of my personality I don't like	

Appendix I Internalization: Thin/Low Body Fat subscale From the Sociocultural Attitudes Towards Appearance Questionnaire-4

T1/T2/T3/T4 (researcher circle as appropriate)

Participant number ……

Directions: Please read each of the following items carefully and indicate the number that best reflects your agreement with the statement.

Definitely Disagree 1	**Mostly Disagree 2**	**Neither Agree Nor Disagree 3**	**Mostly Agree 4**	**Definitely Agree 5**	**Score (1-5)**
1. I want my body to look very thin					
2. I want my body to look like it has little fat					
3. I think a lot about looking thin					
4. I want my body to look very lean					
5. I think a lot about having very little body fat					

Appendix J Physical Appearance Comparison Scale Revised

T1/T2/T3/T4 (researcher circle as appropriate)

Participant number ……

Directions: People sometimes compare their physical appearance to the physical appearance of others. This can be a comparison of their weight, body size, body shape, body fat or overall appearance. Thinking about how you generally compare yourself to others, please use the following scale to rate how often you make these kinds of comparisons.

	Score (0-4)
Never 0 Seldom 1 Sometimes 2 Often 3 Always 4	
1. When I'm out in public, I compare my physical appearance to the appearance of others	
2. When I meet a new person (same sex), I compare my body size to his/her body size	
3. When I'm at work or school, I compare my body shape to the body shape of others	
4. When I'm out in public, I compare my body fat to the body fat of others.	
5. When I'm shopping for clothes, I compare my weight to the weight of others	
6. When I'm at a party, I compare my body shape to the body shape of others	
7. When I'm with a group of friends, I compare my weight to the weight of others	
8. When I'm out in public, I compare my body size to the body size of others	
9. When I'm with a group of friends, I compare my body size to the body size of others	
10. When I'm eating in a restaurant, I compare my body fat to the body fat of others	
11. When I'm at the gym, I compare my physical appearance to the appearance of others	

Appendix K Body Appreciation Scale

T1/T2/T3/T4 (researcher circle as appropriate)

Participant number ……

Directions: Please indicate whether the question is true about you never, seldom, sometimes, often, or always.

1 Never **2 Seldom** **3 Sometimes** **4 Often** **5 Always**	**Score (1-5)**
1. I respect my body. 2. I feel good about my body. 3. I feel that my body has at least some good qualities. 4. I take a positive attitude towards my body. 5. I am attentive to my body's needs. 6. I feel love for my body. 7. I appreciate the different and unique characteristics of my body. 8. My behaviour reveals my positive attitude toward my body; for example, I hold my head high and smile. 9. I am comfortable in my body. 10. I feel like I am beautiful even if I am different from media images of attractive people (e.g. models, actresses).	

0 1 2 3 4 5 6 7 8 9 10 **Not at all satisfied** **Extremely satisfied**	**Score (0-10)**
11. How satisfied are you with your body right now?	

Appendix L Rosenberg Self-esteem Scale

T1/T2/T3/T4

Participant number ……

Directions: Below is a list of statements dealing with your general feelings about yourself. Please state if you strongly agree (SA), agree (A), disagree (D) or strongly disagree (SD) with each statement.

Strongly agree (SA) Agree(A) Disagree (D) Strongly Disagree (SD)	**Answer**
1. On the whole, I am satisfied with myself.	
2. At times, I think I am no good at all.	
3. I feel that I have a number of good qualities.	
4. I am able to do things as well as most other people.	
5. I feel I do not have much to be proud of.	
6. I certainly feel useless at times.	
7. I feel that I'm a person of worth, at least on an equal plane with others.	
8. I wish I could have more respect for myself.	
9. All in all, I am inclined to feel that I am a failure.	
10. I take a positive attitude toward myself.	

Appendix M Self-compassionate letter writing script

Think about a situation that occurred recently where you noticed a personal shortcoming or did something, which left you feeling regretful, disappointed, ashamed, upset or frustrated.

Try your best to hold this situation in mind.

Now try to connect with that part of you that is kind and understanding of others. Think of someone who you really cherish and hold them in mind – they can be family, or a friend or a partner, or anyone important to you. Notice that sense of loving kindness and compassion that you feel for this person, and reflect on how this feels in your body for a moment. Think about what you would say to this person if they were in your position, and the kindness and compassion you would direct towards them.

Now try to take a moment to notice this person directing this warmth, kindness and compassion towards YOU. Think about what this person would say to YOU in this situation.

Write a short one paragraph letter to yourself from the perspective of this person. This letter may take about 5–10 minutes to write, and there is no 'right' or 'wrong' way of doing it. In this, try to have an understanding for your distress (e.g. I am sad you feel distressed…) and recognize that your distress makes sense. Imagine that this person can see all your strengths and all your weaknesses. What would this person write in order to remind you that you are only human, that all people experience difficult times and have both strengths and weaknesses? What would they say to remind you of your particular strengths? Write down what this person feels towards you, loving and accepting you exactly as you are. Try to infuse your letter with a strong sense of this person's acceptance, kindness, caring, and desire for your health and happiness.

Write whatever comes to you, but make sure the letter provides you with what you think you need to hear in order to feel nurtured and soothed about your stressful situation or event. Try and be good to yourself in spite of your disappointments. After writing the letter, re-read it again, really letting the words sink in. Notice how you feel.

Appendix N Daily task instructions

Please complete this exercise every day for the next week. Try your best to think of a personal shortcoming from that day, but if you can't, use one from another recent occasion. You do not need to keep or show anyone the letter. Just make sure you read it through after writing it. Tick off each day when you have done the exercise.

Day 1	**Completed**	☐
Day 2	**Completed**	☐
Day 3	**Completed**	☐
Day 4	**Completed**	☐
Day 5	**Completed**	☐
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