Body Esteem Explains the Relationship Between Mindful Eating and Self-Compassion: a Mediation Analysis

Rebecca Keyte · Georgia Harding-Jones · Misba Hussain · Jeffrey Wood · Helen Egan · Michail Mantzios

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Abstract
Research illustrates that high levels of self-compassion are associated with individuals eating in a mindful way. Previous research focusing upon emotional eating behaviours has suggested that body esteem is a mechanism that links self-compassion to eating behaviours, whilst mindful eating relates negatively to emotional eating and displays another, more adaptive way of eating. The present research explored whether body esteem could explain (i.e. mediate) the relationship between mindful eating and self-compassion. Two hundred participants were recruited to participate in a cross-sectional study to investigate the relationship between mindful eating, self-compassion, and body esteem. The present study highlights a positive correlation between mindful eating and body esteem, with a mediation effect being observed for mindful eating on self-compassion via the appearance subscale of body esteem. Possible explanations and future directions are discussed further with an emphasis on the need for more empirical work. In addition, suggestions are provided regarding the inclusion of body esteem within weight management interventions focusing upon mindful eating and self-compassion.

Keywords Mindful eating · Self-compassion · Body esteem · Eating behaviours

Introduction

The practice of mindfulness is defined as an awareness that emerges through purposefully paying attention in the present moment, non-judgmentally (Kabat-Zinn, 1990), with a large amount of research focusing upon the impact mindfulness can have upon mental and physiological health (e.g. Rizal et al., 2020). Whilst research has focused upon the potential impact of mindfulness on eating behaviours (e.g. Dutt et al., 2019), Mantzios and Wilson (2015a) suggest that the literature would benefit from investigations around the covariance of self-compassion and more explicit and specific investigations to eating, namely, mindful eating.

Mindful eating is the application of mindfulness fundamentals on food-related experiences, that is, purposeful attention to the present moment with a non-judgement or accepting attitude (Allirot et al., 2017). Mindful eating has been integrated into treatment programs for maladaptive eating behaviours that are inclusive of eating behaviour education and contemplative practices (Gale et al., 2014; Kristeller et al., 2014). A more recent definition of mindful eating, which is specific to behaviour, and designed to enable more refined investigations of eating behaviours is as follows: ‘Mindful eating behaviour is defined as the sustained attention on a sensory element of the eating experience (e.g. the taste), and a non-judgmental (or non-evaluative) awareness of thoughts and feelings that are incongruent to the sensory elements of the present eating experience’ (Mantzios, 2020, 2020a, b, p. 4). Mindful eating assists in the gradual change of external to internal eating and influences of external factors such as a desirable smell becoming less of a trigger to eat when there are no physical signals of hunger. Literature suggests that such practices promote healthier eating behaviours (Dutt et al., 2019; Hussain et al., 2020, 2021; Mantzios & Giannou, 2014; Mantzios & Wilson, 2014, a, b), such as a reduction in the consumption of sweets (Mason et al., 2016a) and an increased intake of fruit and vegetables (Gilbert & Waltz, 2010). Research has found a negative association between mindful eating and grazing (Mantzios et al., 2018a) and motivations to eat palatable foods (Mantzios & Egan, 2018), as well as weight gain (Mantzios et al., 2015; Mason et al., 2016b), with mindful eating being associated with a lower BMI, as well as decreased fat and sugar consumption
Mindful eating laboratory experiments have highlighted the potential of reducing consumption through different mindful eating interventions and in environments that are known to promote mindless eating (see Mantzios et al., 2020a, b).

Recently, mindful eating has gained attention within the study of weight management alongside self-compassion, with research illustrating that high levels of self-compassion are associated with individuals eating in a mindful way (Keyte et al., 2020; Taylor et al., 2015) and with self-compassion and mindful eating being integrated into practices to promote adaptive and healthier eating behaviours (Mantzios & Wilson, 2014, 2015a, b). Self-compassion can be conceptualised as taking a kinder approach towards oneself during personally challenging times, with a mindful awareness and understanding that one’s experiences are part of what all people go through (Neff, 2003a, b). Self-compassion consists of three main elements: self-kindness, common humanity, and mindfulness (Neff, 2003a, b).

Whilst previous research acknowledges the relationship between mindful eating and self-compassion (e.g. Keyte et al., 2020; Mantzios & Egan, 2018; Mantzios et al., 2018a, b), the question of why a more adaptive self-perception would relate to mindful eating, and whether there is actually another construct that explains this relationship, is an area that is largely unexplored. Research reports that higher self-compassion is related to a greater body acceptance and appreciation and lower body dissatisfaction (Ferreira et al., 2011, 2013; Kelly et al., 2014a; Schoenefeld & Webb, 2013; Wasylkiw et al., 2012; Webb & Forman, 2013). Literature further suggests a protective role of self-compassion in buffering against low body esteem and negative eating behaviours (Braun et al., 2016; Carbonneau et al., 2020; Homan & Tylna, 2015; Kelly & Stephen, 2016; Neff & Vonk, 2009; Wasylkiw et al., 2012), with self-compassion also buffering against body dissatisfaction when being of a higher body mass index (Kelly et al., 2014b). Body esteem is an attitude measure of satisfaction or dissatisfaction towards one’s physical appearance (Krishen & Worthen, 2011; Mendelson et al., 2001) and is closely linked with body dissatisfaction (Menzel et al., 2010). Individuals can find it challenging to accept their self-image (Neumark-Sztainer et al., 2006; Pelegrini & Petroski, 2010), with this being associated with adverse psychological health outcomes, such as depression, anxiety (Mackson et al., 2019), and maladaptive eating behaviours (Grabe et al., 2008; Regan et al., 2021).

Carbonneau et al. (2020) suggested that body esteem is a mechanism that links self-compassion to eating behaviours, whilst there is limited research focusing upon the interrelation between body esteem and mindful eating. Neumark-Sztainer and colleagues (2021) found in a population sample an association between yoga and mindful eating (when compared to non-yoga users), although this did not signify an association to body image. Contrary, Webb et al. (2018) found an association of mindful eating to positive body image indices in a sample of women attending a public university using a more comprehensive methodology in measuring body image. Whilst the association of mindful eating to body image is not clear, the difference in measuring mindful eating between those two studies, as well as the differences between mean age and female (versus mixed gender) samples, can add to potential explanations. Considering the relationship between self-compassion and body esteem and self-compassion and mindful eating, the present study aimed to investigate the relationship between body esteem, self-compassion, and mindful eating in an attempt of supporting literature around the positive association of mindful eating and body esteem. Furthermore, previous findings propose that adopting a healthier perception of oneself through self-compassion is associated to body esteem, and the underpinning of mindfulness that exists within self-compassion may explain the potential association to mindful eating. Meanwhile, considering the behavioural aspects of mindful eating—that is, being immersed in the moment, listening to one’s body, and creating a body–mind connection—of adaptive eating, the association to self-compassion may be apparent in a continuum of self-care (Mantzios & Egan, 2017), which may derive from body esteem. In other words, mindful eating, and the potential of being a behavioural interpretation of kindness, compassion, and understanding towards oneself, is largely an unexplored area, and mindful eating predicting self-compassion may derive from the adaptive relationship of mindful eating to body esteem (Webb et al., 2018). Therefore, it was hypothesised that (a) body esteem, mindful eating, and self-compassion would positively relate to each other and (b) body esteem would mediate the relationship between mindful eating and self-compassion.

**Methods**

**Participants**

Two hundred participants (females (biological sex), 157; males, 43) were recruited via volunteer sampling. Participants responded to an advertisement placed on social media (via Facebook and Instagram) as well as the Research Participation Scheme (RPS) used at a West Midlands University (134 participants were students at the West Midlands University), to participate in a study investigating eating behaviours and attitudes. Individuals were excluded if they were under 18 years of age. Participants reported an average age of 23.13 (SD = 8.32) and an average BMI of 25 (SD = 6.1). Frequencies and percentages for sex and ethnicity are presented in Table 1. Participants recruited via RPS were awarded research credits upon completion of the study.
Participants recruited via social media did not receive any benefits or rewards for taking part in this research. There were no significant differences between rewarded and non-rewarded participants in demographic characteristics and scale measurements.

**Materials**

**Participant Information Sheet**

Participants were requested to report their age, sex, and ethnicity. Participants also reported their height and weight for BMI to be determined; the following formula was used to calculate BMI: weight in kg/height in m².

**Mindful Eating Behaviour Scale (MEBS) (Winkens et al. (2018))**

The MEBS was used to measure the level of four domains of the attention element of mindful eating: focused eating (5 items, e.g. ‘I notice how my food looks’); eating with awareness (3 items, e.g. ‘I eat something without being really aware of it’, reversed item); eating in response to hunger and satiety cues (5 items, e.g. ‘I trust my body to tell me when to eat’); and eating without distraction (4 items, e.g. ‘I multi-task when I am eating’, reversed item). Answer options ranged from 1 ‘never’ to 5 ‘very often’. Higher scores indicate a higher level of mindful eating. Cronbach’s alpha of the mindful eating domains was 0.85 for focused eating, 0.89 for eating in response to hunger and satiety cues, 0.81 for eating with awareness, and 0.70 for eating without distraction.

**Self-Compassion Scale (SCS) (Neff (2003)a)**

The SCS assesses an individual’s likelihood of being self-compassionate during times of distress and disappointment (Neff, 2003a). The SCS consists of 26 items and utilises a 5-point Likert scale, with responses ranging from 1 (almost never) to 5 (almost always). Scores for this scale range from 26 to 130. Sample items include ‘I’m disapproving and judgemental about my own flaws and inadequacies’ (i.e. self-judgement) and ‘I try to be loving towards myself when I’m feeling emotional pain’ (i.e. self-kindness). The present study produced an alpha of (a = 0.92) for the SCS, with the SCS being divided into six subscales. Each subscale contains the following number of items, with the reported alpha scores for each subscale being as follows: self-kindness (5 items, a = 0.78); self-judgement (5 items, a = 0.77); common humanity (4 items, a = 0.80); isolation (4 items, a = 0.79); mindfulness (4 items, a = 0.75); and over-identification (4 items, a = 0.81).

**Body Esteem Scale for Adolescents and Adults (BESAA) (Mendelson et al. (2011))**

The BESAA assesses participants’ attitudes and feelings towards their self-image. The scale contains 23 items and utilises a 5-point Likert scale, with responses ranging from 0 (never) to 4 (always). Scores for this scale range from 0 to 92. Sample items include ‘I worry about the way I look’ (i.e. appearance) and ‘I feel I weigh the right amount for my height (i.e. weight). The present study produced an alpha of a = 0.95 for the BESSA, with the BESAA being divided into three subscales. Each subscale contains the following number of items, with the reported alpha scores for each subscale being as follows: appearance (10 items, a = 0.86); attribution (5 items, a = 0.84); and weight (8 items, a = 0.88).

**Procedure and Design**

Potential participants, who were all above the age of 18 years, responded to online invitations (via social media and RPS) to take part in the present study. Potential participants were provided with a link to click on, which directed them to a participant information sheet containing all study information, along with the researchers’ contact details. Those who wished to participate were then directed to a consent form. Upon providing written informed consent, participants were presented with the demographic form and the questionnaires; contact details were not collected from participants; however, they did have the option of contacting the researchers via email if they had any questions or wished to discuss the research further. Once the study was complete, participants were presented with a debriefing sheet, informing them of the study, and again providing participants with the contact details of the researchers if they wanted to withdraw or wished to find out the results of the study at a later date; in order to withdraw their data, participants would have needed to email the researcher containing the personalised code they created at the start of the research (no participants withdrew their data). Ethical approval was
Table 2 Zero-order correlations for all primary variables

| Measure      | 1   | 2   | 3   | 4     | 5     | 6     | 7   |
|--------------|-----|-----|-----|-------|-------|-------|-----|
| 1. SCS       | 1   |     |     |       |       |       |     |
| 2. MEBS      | .178*| 1   |     |       |       |       |     |
| 3. BESAA     | .551**| .275**| 1       |       |       |       |     |
| 4. BESAA, appearance | .599**| .273**| .938**| 1       |       |       |     |
| 5. BESAA, attribution | .193**| .137| .680**| .561**| 1       |       |     |
| 6. BESAA, weight | .495**| .257**| .906**| .757**| .447**| 1       |     |
| 7. BMI       | −.017| −.241**| −.288**| −.149*| −.179*| −.398**| 1   |

* <.05; ** <.01

SCS, Self-Compassion Scale (Neff, 2003a); MEBS, Mindful Eating Behaviour Scale (Winkens et al., 2018); BESAA, Body Esteem Scale for Adolescents and Adults (Mendelson et al., 2011)

Results

Inter-correlations for all study variables are presented in Table 2. All variables were significantly correlated in the predicted direction. Mindful eating related negatively to BMI, with body esteem displaying a significant positive correlation with self-compassion and mindful eating.

An initial mediation was conducted to examine the relationship between mindfulness and self-compassion. The mediation analysis showed a significant indirect effect of mindful eating on self-compassion through overall body esteem ($b = .262, p < .001$). However, the total effect was not significant ($b = .356, p = .005$).

A parallel mediation was conducted to examine the relationship between mindfulness and self-compassion, controlling for body esteem. This analysis showed a significant indirect effect of mindful eating on self-compassion through the appearance subcomponent of body esteem ($b = .229, p < .001$), but not through attribution ($b = -1.01, p = .004$) or weight ($b = .242, p = .170$).

Discussion

This study aimed to investigate the relationship between mindful eating, self-compassion, and body esteem, as well as whether body esteem mediates the relationship between mindful eating and self-compassion. It was hypothesised that body esteem would mediate the relationship between mindful eating and self-compassion.

Results showed that mindful eating was negatively correlated with BMI, while body esteem was positively correlated with self-compassion and mindful eating. The mediation analysis demonstrated that body esteem mediates the relationship between mindful eating and self-compassion, with the appearance subcomponent being the most significant mediator ($b = .548, p < .001$).
that (a) body esteem, mindful eating, and self-compassion would positively relate to each other and (b) body esteem would mediate the relationship between mindful eating and self-compassion. In line with previous research (Jordan et al., 2015; Mantzios et al., 2018b), the present study suggested that mindful eating is associated with a lower BMI and healthier eating behaviours and highlighted a positive correlation between body esteem and mindful eating that has not been explored within previous work. In line with predictions, the findings illustrated that participants who demonstrated higher levels of body esteem reported that they ate in a mindful way, whilst both related positively to self-compassion.

When findings were explored further, a mediation effect was observed for mindful eating on self-compassion via the appearance subcomponent of body esteem, thus supporting the hypothesis. Previous research focusing on emotional eating had suggested that body esteem is a mechanism that links self-compassion to eating behaviours (Carbonneau et al., 2020). The influence body esteem has upon mindful eating and self-compassion has not been previously explored, with the present study suggesting that body esteem specifically focused upon one’s appearance and influences one’s eating behaviours and the way eating relates to self-compassion. Further research is required to investigate the effect that body esteem, alongside self-compassion and mindful eating, has upon eating behaviours such as grazing (Mantzios et al., 2018a) and motivations to eat palatable foods (Mantzios & Egan, 2018) as well as fat and sugar consumption (Mantzios et al., 2018b; Mason et al., 2016a). The potential of appearance and body esteem as influential factors in interventions that are targeting eating behaviours and healthy or moderated eating may be an element to which participants can readily relate and may potentially influence the uptake of eating interventions.

Whilst current interventions focus on mindful eating and mindfulness (Gale et al., 2014; Kristeller et al., 2014), the present findings focus on body esteem, in particular one’s appearance, which could lead to more effective interventions that target non-judgement (in line with mindful eating and self-compassion) to aid elements around appearance and weight (Kristeller et al., 2006; Mantzios & Giannou, 2014). The mindful construal diary (MCD) encourages individuals to be present in the moment whilst also being kind and non-judgemental to thoughts and feelings that arise during each meal (Mantzios & Wilson, 2014), but the embedment of elements around body esteem may create a more holistic approach to elements that may be problematic within the eating regulation continuum. Work is now needed to investigate the impact of incorporating a focus on body esteem within such interventions and the potential impact this would have on reducing the consumption of palatable and unhealthy foods.

Whilst these findings provide suggestions for future interventions, limitations do need to be acknowledged. Firstly, the average reported BMI for participants within this research was within the optimal range (albeit on the limit of the optimal range); therefore, replications within obese and bariatric populations, as well as amongst disordered eaters and dieters, would provide a wider picture of determining the impact body esteem has upon eating behaviours and self-compassion. In addition, it does have to be acknowledged that there is wide agreement in the medical literature that BMI is seriously flawed as it does not distinguish fat from fat-free mass (e.g. muscle and bone); consequently, future research should consider alternate specifications of weight and height and more accurate measures of obesity as suggested by Burkhauser and Cawley (2008). Furthermore, males were underrepresented, with ethnicity also containing unequal representation; this was as a consequence of volunteer sampling being utilised, meaning that the researchers could not control for demographic characteristics. Additionally, the cross-sectional nature of this research mandates further research that can highlight the predictability and potential impact of self-compassion through changes in body esteem on mindful eating. The researchers acknowledge that in online studies, it cannot be checked whether the participants are self-reporting correct information. Future research needs to investigate males as well as all ethnicities in an attempt to explore the potential of body esteem being incorporated within mindful eating and self-compassion interventions; further variables which could also influence the reported relationships include the place of residence, lifestyle, and psychiatric conditions.

Overall, this study provides insight into the influence body esteem has upon both mindful eating and self-compassion, in particular in regards to one’s appearance. The findings from this research could inform interventions, suggesting that mindful eating and self-compassion interventions should also focus on body esteem. Nonetheless, further research is required within this area.

Data Availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics Approval and Consent to Participate All procedures performed within this research which involved human participants were in accordance with the ethical standards of the institutional and/or national research committee (Ethics Reference: PSY_BSc_Dec18_74) and with
the 1964 Helsinki Declaration and its later amendments. Informed consent was obtained from all individual participants included in the study.

**Competing Interests** The authors declare no competing interests.

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