Body Image 35 (2020) 22–29

Contents lists available at ScienceDirect

Body Image

journal homepage: www.elsevier.com/locate/bodyimage

A Randomised Controlled Trial Examining the Effects of Self-Compassion Meditations on Women's Body Image

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ARTICLE INFO

Article history:
Received 15 September 2019
Received in revised form 29 July 2020
Accepted 29 July 2020
Available online 23 August 2020

Keywords:
Appearance-contingent self-worth
body appreciation
body shame
meditation
self-compassion

ABSTRACT

Although research has suggested that body image improves following self-compassion meditation training, studies have been limited due to the use of a wait-list control group. This study therefore compared the effects of self-compassion meditations to an active control group. Seventy young adult women (17-35 years) were randomly assigned to receive either self-compassion or nature-focused guided imagery meditations. Over one week, participants engaged in two meditations and completed pre- and post-test measures of trait self-compassion, body appreciation, body shame, and appearance-contingent self-worth. A mixed design analysis of variance revealed a main effect of time; women in both meditation groups demonstrated significant increases in self-compassion and body appreciation, and significant reductions in body shame. No effect was found for appearance-contingent self-worth. There were no interactions or main effects for group. Self-compassion may improve body image in women, although there was no evidence for an advantage of self-compassion over guided imagery meditations. Common elements between self-compassion and guided imagery may be a mechanism for improving body image. However, further research is warranted to isolate the effects of these meditations from other specific and non-specific treatment effects. (This study was pre-registered with the Australian New Zealand Clinical Trials Registry, ACTRN12618001814268).

1. Introduction

A substantial body of literature has demonstrated the high prevalence of body concerns in young women (Cain, Epler, Steinley, & Sher, 2010; Neighbors & Sobal, 2007; Rozin, Bauer, & Catanese, 2003). In Western society, young women may be frequently exposed to media images of unrealistic body standards that objectify women and stimulate appearance comparison (Fardouly, Willburger, & Vartanian, 2018; Grabe, Ward, & Hyde, 2008; Want, 2009). According to objectification theory, these body standards can lead women to self-objectify, that is, to view their body as something to be scrutinised and evaluated (Fredrickson & Roberts, 1997). Thus, women may consider themselves a failure for not meeting these standards, creating what is known as body shame (Myers & Crowther, 2009). Furthermore, women who internalise these unrealistic body standards may place their self-worth in their appearance (Buote, Wilson, Strahan, Gazzola, & Papps, 2011).

Recently, body image research has shifted from a primary focus of body image disturbance to a consideration of positive body image (Halliwell, 2015), viewed as not merely being low levels of negative body image (Seekis, Bradley, & Duffy, 2017). Within the domain of positive body image, self-compassion has emerged as a potential means to improve body image in women (Halliwell, 2015). Self-compassion differs from self-esteem in that it involves unconditional love towards the self and is not contingent on others as a benchmark of success (Neff & Vonk, 2009). As defined by Neff (2003a), self-compassion has three main components: (a) common humanity, which involves recognising that all humans have imperfections and that feelings of inadequacy are universal rather than an isolated experience; (b) self-kindness, which promotes understanding and comfort towards oneself in times of suffering and failures, as opposed to harsh criticism; and (c) mindfulness, which encompasses a non-judgemental awareness of one's thoughts and emotions in a way that does not magnify or avoid but retains a balanced view.

Self-compassion is associated with numerous positive health indicators, including gratitude, well-being, life satisfaction, and optimism (Smeets, Neff, Alberts, & Peters, 2014; Voci, Veneziani, & Fuochi, 2019). Applied to body image, self-compassion may allow women to recognise that humans all have imperfections

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https://doi.org/10.1016/j.bodyim.2020.07.009
1740-1445/

and encourage women to show kindness and acceptance towards their body, thus forming a new appreciation of their body (Albertson, Neff, & Dill-Shackleford, 2015). Indeed, numerous correlational studies demonstrate that women with high levels of self-compassion have higher levels of body appreciation (Homan & Tylka, 2015; Marta-Simões, Ferreira, & Mendes, 2016; Tylka, Russell, & Neal, 2015; Wasylkiw, MacKinnon, & MacLellan, 2012). Self-compassion is also related to lower levels of body concerns, specifically body shame and appearance-contingent self-worth (Daye, Webb, & Jafari, 2014; Ferreira, Pinto-Gouveia, & Duarte, 2013; Homan & Tylka, 2015; Liss & Erchull, 2015; Wasylkiw et al., 2012). Mindful awareness of imperfections supports women to view their bodies without judgement or over identification with perceived flaws and may therefore lower feelings of body shame (Albertson et al., 2015; Neff, 2003a). Furthermore, self-compassion is linked with self-worth stability (Neff & Vonk, 2009) and thus, may teach individuals that their self-worth is intrinsic and not determined by their appearance (Neff, 2003a).

A range of intervention approaches have implications for improving self-compassion and body image (Alleva, Sheeran, Webb, Martijn, & Miles, 2015; Dunaev, Markey, & Brochu, 2018). For example, body-focused gratitude has been shown to improve body satisfaction, appearance evaluation, and lower weight bias internalisation compared to control groups (Dunaev et al., 2018). Gratitude contains elements of mindfulness and self-kindness, lending similarity to self-compassion interventions. Direct approaches to increasing self-compassion have included writing tasks and self-compassion focused online meditation training. Women instructed to write self-compassionately have demonstrated improvements in body appreciation and satisfaction compared with various control groups (Seekis et al., 2017; Stern & Engeln, 2018). Across two studies, self-compassion focused meditation training has similarly shown improvements in self-compassion, body appreciation, body shame, and appearance-contingent self-worth in women, compared with waitlist control groups (Albertson et al., 2015; Toole & Craighead, 2016).

Whilst both writing tasks and online meditation training are cost-effective and easily accessible self-guided interventions that warrant continued examination, the present study focuses on self-compassion focused meditation training, which has yet to be compared to an active control group. In Albertson et al.'s (2015) study (N = 228, ages 18-60 years) women who listened to three different 20-minute online self-compassion meditations over three weeks demonstrated increased self-compassion and body appreciation, and reduced body shame and appearance-contingent self-worth, compared to the waitlist control group. Toole and Craighead (2016) retained the three self-compassion meditations, reduced the duration of the intervention to one week, and focused on undergraduate women with body concerns (N = 80, ages 18-21 years). Results were similar to Albertson et al.'s (2015) study; women in the self-compassion group demonstrated greater increases in body appreciation and decreases in appearance-contingent self-worth compared to the waitlist-control group (Toole & Craighead, 2016). However, benefits did not extend to all outcome variables, with no changes reported to body shame or body dissatisfaction and no significant improvement in overall self-compassion (Toole & Craighead, 2016). Albertson et al.'s. (2015) results showed medium effect sizes when comparing between pre- and post-intervention, which were also higher compared to Toole and Craighead's (2016) which showed small effect sizes. Notably, pre-intervention, Albertson et al.'s sample reported higher body shame and dissatisfaction, and lower self-compassion, compared with Toole and Craighead's sample, which may have presented greater opportunities for improvement. As self-compassion training is intended to improve overall self-compassion and reduce body shame, these different patterns of results require investigation.

While the initial results are promising, an active control group would further help by testing for the effect of non-specific treatment effects, such as placebo effects. In the present study, a nature-focused guided imagery meditation was used in which listeners are guided by a narrator in visualising a natural environment (e.g., a sunrise on the beach). Guided imagery accommodates similarities between the meditations such as a soothing voice, delivery, and the guided aspect, whilst not emphasising awareness of specific body parts or teaching the listener to show compassion to their self. This comparison would help determine whether deliberately teaching self-compassion is critical in the capacity of online meditations to improve the outcome variables of interest. The aim of the current study was thus to investigate the effects of online self-compassion meditations, compared with guided imagery meditations, on young women's trait self-compassion, body appreciation, body shame, and appearance-contingent self-worth.

The study focused on positive body image and participants were not recruited based on having negative body image as in the previous studies (Albertson et al., 2015; Toole & Craighead, 2016). Although women with negative body image would arguably benefit most by body image interventions and the focus of these studies is justified, focusing only on women with negative body image ignores the possibility that women generally may also benefit from positive body image interventions. This argument takes the view that positive body image is more than the absence of negative body image.

An additional difference to the past studies is that women received two, rather than three, different meditations as part of their allocated condition over a one-week period. In considering potential beneficial implications from reducing the number of meditations, we raise three possibilities. First, with fewer meditations, participants may feel less psychological pressure during the study. The completion of two meditations, compared with three, may feel more manageable and less burdensome to incorporate into the participant's life within a week-long period. Second, in focusing on fewer meditations, participants may experience each meditation deeper and concentrate on its teaching without the inclination to move quickly onto the next. Third, more is not always better and, indeed, there may be diminishing returns after participants are exposed to the main concepts involved. This final point aligns with Toole and Craighead (2016) finding improvements despite over half of participants listening only to the initial compassionate body scan meditation.

Given that attrition was high in Albertson et al.'s (2015) three-week study (a loss of 251 of the 479 participants who were initially recruited for the study) and low in Toole and Craighead's (2016) one-week study (a loss of 7 of the 87 participants), this study used a one-week time period. Toole and Craighead suggested further investigation is warranted to address the low compliance rate of meditation at home and thus the present study accompanied each meditation with a brief set of questions to encourage engagement and confirm participation. It was hypothesised that, compared to those who engaged in the guided imagery meditations, women who engaged in the self-compassion meditations would demonstrate significantly (a) higher levels of self-compassion and body appreciation; and (b) lower levels of body shame and appearance-contingent self-worth.

2. Method

2.1. Participants

Participants were recruited via university lecture announcements, social media (e.g., Facebook and Instagram), and flyers

displayed in supermarkets and in psychology clinic waiting rooms. The study was kept open for 6 months to provide an attrition buffer, given that the attrition rate was high in Albertson et al.'s (2015) study as is typical in Internet studies (Eysenbach, 2005). Forty participants received partial course credit for participation and all participants were entered into a prize draw for a $100AU gift voucher. Inclusion criteria were being female, age between 17 and 35 years, and having Internet access.

The final sample included 70 women aged between 17 and 35 years (M = 22.14, SD = 3.98), with a mean body mass index (BMI) of 22.68 kg/m^2 (SD = 4.15). Young women were selected for this study, as they are especially vulnerable to experiencing body concerns (Novotney, 2009). Descriptive information for each group is displayed in Table 1. Although this study did not recruit for women with body concerns, the baseline measures of body image for this sample are similar to Toole and Craighead's (2016) sample for most variables but, compared with Albertson et al.'s (2015), higher for body appreciation and lower for body shame (see Table 2 for a comparison of baseline body image measures). Notably, appearance-contingent self-worth was lower in the current sample than in both previous samples.

2.2. Design

This study was a randomised controlled trial. The researchers were blinded to the allocation of participants. Participants were informed that the study was observing guided imagery and self-compassion on body image but were not aware which group was the main group of interest. Participants enrolled in the study online through Survey Monkey and were randomly allocated into one of the two groups using the software's full randomisation capability. The dependent variables were all self-reported. The trial was pre-registered with the Australian New Zealand Clinical Trials Registry (ACTRN12618001814268). The protocol was followed as planned, although additional post-hoc analyses are reported in the Post-Hoc Analyses subsection of the Results.

2.3. Materials

2.3.1. Experimental stimuli

Two auditory guided imagery meditations were chosen for the guided imagery group, 'The Meadow' and 'Sunrise on the Beach' (Frank, 2019). The guided imagery meditations teach breathing techniques and muscle relaxation, drawing focus to a naturalistic environment.

Two auditory self-compassion meditations used in previous research (Albertson et al., 2015; Toole & Craighead, 2016) were chosen for the self-compassion group, the 'Compassionate Body Scan' and 'Loving Kindness Meditation' (Neff, 2019). The self-compassion meditations focus on bringing awareness and compassion to the body, showing love and gratitude towards people in one's life, and applying that same gratitude towards one's own life. Permission for use was granted by the creators and the meditations may be accessed on the creators' websites (Frank, 2019; Neff, 2019). Each meditation took approximately 20 minutes.

2.3.2. Manipulation check and engagement questions

Participants were asked four questions after listening to each meditation. Two questions following each self-compassion meditation prompted engagement with the self-compassion element covered (e.g., "sometimes we have judgments about our stomach, how would you show compassion towards your stomach?"), whilst two following the guided imagery meditations prompted reflection on the feelings experienced (e.g., "how do you feel after listening to this meditation?"). These questions were selected given that the self-compassion meditations were intended to teach skills, whereas the guided imagery meditations were to promote relaxation. Following both meditation types, a third question required recollection of simple details as a manipulation check (e.g., "did the meditation mention a boat?") and a final question asked what the participant liked or did not like about the meditation.

2.3.3. Demographics

Participants reported their age, ethnicity, prior meditation experience, height, and weight (used to calculate BMI), and whether they were a current student or a community member.

2.3.4. Self-compassion

The Self-Compassion Scale (Neff, 2003b) is a 26-item measure of six components of self-compassion: self-kindness, common humanity, mindfulness, self-judgement, isolation, and over-identification. A sample item includes "I'm kind to myself when I'm experiencing suffering". Items are rated on a 5-point Likert scale (1 = *almost never*, 5 = *almost always*). Higher scores indicate higher levels of self-compassion. The total score was used in this study as recommended by Neff et al. (2018). SCS scores have shown good construct validity and good test-retest reliability at 3 weeks in young adult women (Neff, 2003b). Cronbach's alpha scores from the present study for each scale are provided in Table 2.

2.3.5. Body appreciation

The Body Appreciation Scale-2 (Tylka & Wood-Barcalow, 2015) is a 10-item measure of one's acceptance and respect for their body. A sample item includes "I respect my body". Items are rated on a 5-point Likert scale (1 = *never*, 5 = *always*) and averaged to obtain an overall score, with high scores indicating higher body appreciation. BAS-2 scores have demonstrated good test-retest reliability over a 3-week period with correlations of r = .90 for both men and women. Moreover, BAS-2 scores have demonstrated good construct validity, and were strongly positively correlated with appearance evaluation, and strongly inversely correlated with body dissatisfaction for men and women, in a sample of community and college adults (Tylka & Wood-Barcalow, 2015).

2.3.6. Body shame

The Objectified Body Consciousness-Body Shame Subscale (McKinley & Hyde, 1996) is an eight-item measure of the extent one feels shame when they perceive their body does not fulfil the cultural ideals. A sample items includes "I would be ashamed for people to know what I really weigh". Items are measured on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*) and averaged to obtain an overall subscale score, with high scores indicating higher body shame. Scores on the Body Shame Subscale have demonstrated good construct validity, with a strong positive correlation with both appearance orientation and public body consciousness, and a moderate inverse correlation with body esteem, in a sample of undergraduate women (McKinley & Hyde, 1996).

2.3.7. Appearance-contingent self-worth

The Contingencies of Self-Worth Scale-Appearance Subscale (Crocker, Luhtanen, Cooper, & Bouvrette, 2003) is a five-item self-report measure of the degree one's self-worth is based on their appearance. A sample item includes "When I think I look attractive, I feel good about myself". Items are measured on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*) and averaged to obtain an overall score, with higher scores indicating greater appearance-contingent self-worth. Scores on the Appearance Subscale have demonstrated good test-retest reliability with correlations ranging from r = .68 to .92 for the 3-month interval, and r = .51 to .88 for the 8.5-month interval, in university students. Moreover, Appearance Subscale scores demonstrated good construct validity, as shown

Table 1
Demographic Characteristics of the Sample by Group

Factor	Self-compassion (n = 37)			Guided imagery (n = 33)		
	M	*SD*	Range	*M*	*SD*	Range
Age (years)	22.92	4.31	17-35	21.27	3.43	17-30
BMI (kg/m^2)	23.17	5.03	18.55-40.71	22.12	2.86	13.21-27.92
		n	(%)		*n*	(%)
Prior meditation experience						
Never		17	(45.90)		20	(60.60)
Occasionally		14	(37.80)		8	(24.20)
Frequently		6	(16.20)		5	(15.20)
Student		24	(64.90)		26	(78.80)
Community member		13	(35.10)		7	(21.20)
Nationality						
Australian		33	(89.20)		25	(75.80)
Other		4	(5.40)		8	(4.03)

Note. BMI = body mass index. Occasionally = 10-60 minutes per week. Frequently = 70+ minutes per week. Other = New Zealander, United Kingdom, Eastern European, and Western European.

Table 2
Scale Internal Consistency and Baseline Measures for the Sample, with Comparisons to Albertson et al. (2015) and Toole and Craighead (2016)

Factor	Internal consistency (α)		Current Study Sample (N = 70)	Albertson et al. (2015) Sample (N = 228)	Toole and Craighead (2016) Sample (N = 80)
	Pre-test	*Post-test*	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Self-compassion	.93	.94	2.90 (0.67)	2.64 (0.73)	2.78 (0.63)
Body appreciation	.92	.92	3.42 (0.73)	2.97 (0.89)	3.44 (0.74)
Body shame	.80	.80	3.73 (1.13)	4.29 (1.44)	3.29 (1.25)
Appearance-contingent self-worth	.71	.78	4.80 (0.96)	5.41 (0.94)	5.44 (0.82)

Note. Internal consistency scores are from the current study.

by positive correlations with narcissism and the extent to which self-worth is based on others' approval (Crocker et al., 2003).

2.4. Procedure

Ethics approval was granted by the Human Research Ethics Committee of the University of the Sunshine Coast and data were collected from November 2018 to March 2019. Participants were informed that the study was about self-compassion, guided imagery, and body image, and would be completed over one week. Participants accessed the survey online via Survey Monkey to provide demographic information and complete the pre-test questionnaire and were randomised into the self-compassion or guided imagery group. Mail Chimp was used to automate the study, with meditations emailed to participants on set days with a request to complete it within three days. A reminder was sent to those who had not opened the emails before the end of the week period.

Both groups were emailed a link to the first meditation on the same day they completed the pre-test questionnaire (completed on average 0.53 days [*SD* = 1.16] after the pre-test questionnaire for the self-compassion group and 0.94 days [*SD* = 2.16] after for the guided-imagery group). The second meditation was emailed to participants on Day 4 and was completed on average 5.03 days (*SD* = 2.55) after the first meditation for the self-compassion group and 4.13 days (*SD* = 2.05) after for the guided imagery group. The links to each meditation were embedded in Survey Monkey along with the manipulation check and engagement questions. Participants from both groups were emailed a link to the post-test questionnaire on Day 7, which was completed on average 2.59 days (*SD* = 1.58) after the second meditation for the self-compassion group and 2.68 days (*SD* = 1.49) after for the guided imagery group. The overall average completion time for the study was 8.18 days (*SD* = 1.90, range 7-15) for the self-compassion group and 7.81 days (*SD* = 1.71, range 7-16) for the guided imagery group; average completion time did not differ between groups, $t(68) = -0.95$, $p = .344$. Participants were debriefed when all data collection was complete and were provided a summary of the study results and thanked for their participation. Participants then supplied an e-mail address if they wished to be entered into the prize draw for a $100AU gift voucher.

3. Results

3.1. Preliminary Analysis

Participant group allocation and attrition is displayed in Fig. 1 using the CONSORT (2010) flow diagram. The initial 179 participants were randomised into the self-compassion (n = 95) and guided imagery groups (n = 84). During the study, 109 participants dropped out at various stages, including the first meditation (n = 56), second meditation (n = 41), and post-test questionnaire (n = 6). Two participants did not provide a valid e-mail address and four unsubscribed by choice. Participants' responses for the manipulation check were screened. The research team discussed appropriate and relevant responses (e.g., participants correctly recalled details of the meditations). Responses were also screened for incomplete answers. All participants were considered to have demonstrated appropriate engagement, shown by detailed and relevant responses to the specific questions asked. For example, responses from the self-compassion questions reflected that participants were guided to focus on how they can show compassion to their body (e.g., "try to relax and focus on what that body part does for the whole body and how strong it is"); responses from the guided imagery questions reflected that participants were guided to focus on details of the meditation (e.g., "I enjoyed how visual it was and that it included feelings of warmth [sun], and coolness [cool sand])."

For those who did complete the pre- and post-tests, there was minimal missing data (0.15% across all variables) and mean substitution was used (Parent, 2013). One participant was removed from the body shame analysis for having more than 30% missing data on that scale. A per-protocol analysis was used given the high likelihood of attrition in an Internet study. Whilst this may introduce

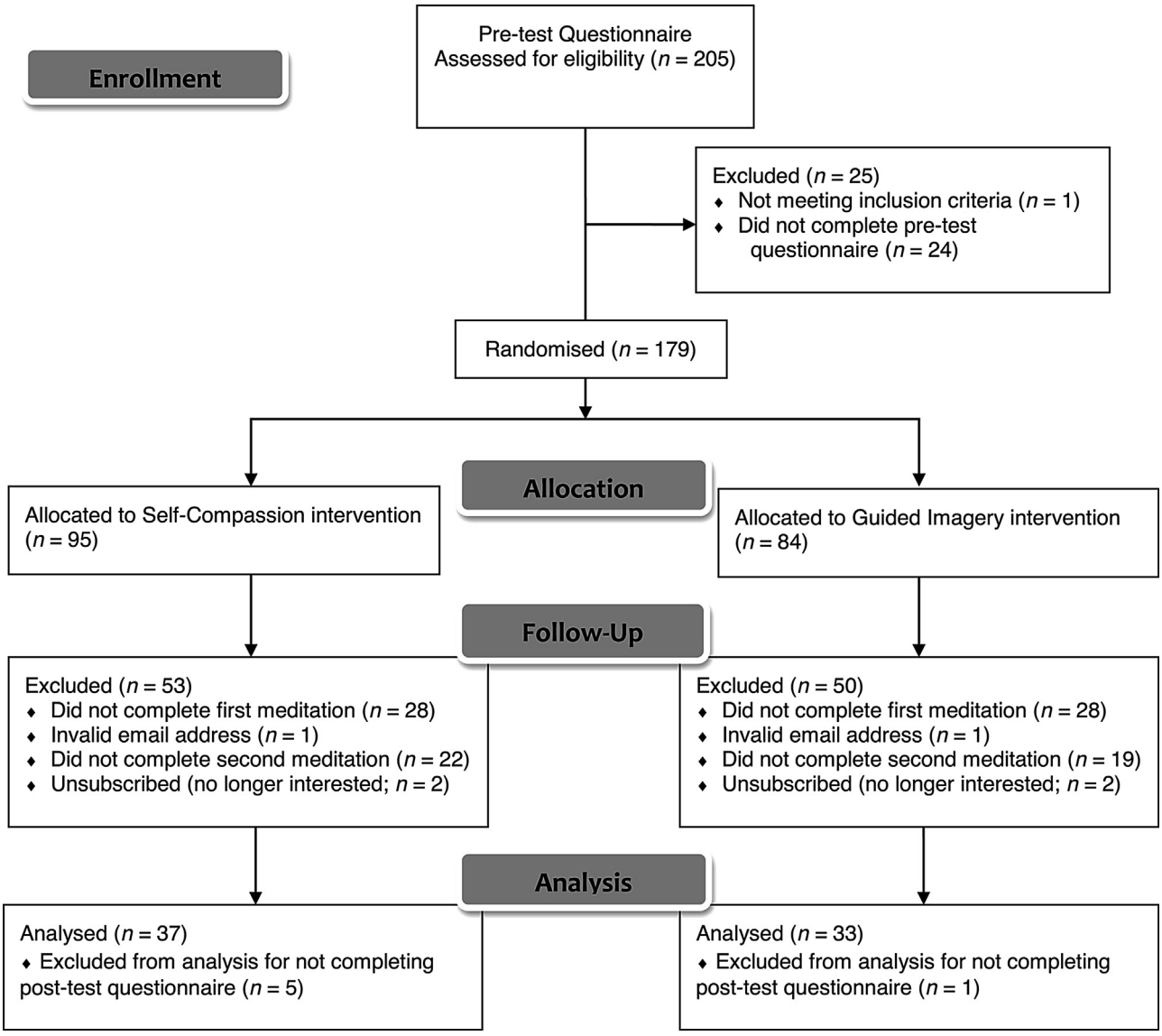

Fig. 1. CONSORT flow diagram demonstrating the progress and attrition of participants through each intervention.

bias due to selective attrition, it better represents the outcomes for participants who willingly continue, which reflects the target population likely to use self-help interventions (Eysenbach, 2005). Of note, the attrition rates were similar for both conditions, suggesting that selective attrition did not occur.

All statistical assumptions were met for analysis of variance (ANOVA). The data were assessed for outliers via box-plots and assessing Mahalanobis distance values at the $p < .001$ level. Removal of two identified outliers for BMI did not influence the outcome and because there was no *a priori* exclusion criterion related to BMI, the two outliers were retained. Assumption of normality was assessed using Kolmogorov-Smirnov test, which revealed that this assumption was met for all items, except for appearance-contingent self-worth (p <. 05). However, skewness and kurtosis values were acceptable and the data were retained given that Kolmogorov-Smirnov test is known to be overly sensitive (Ghasemi & Zahediasl, 2012). The assumption of homogeneity of variance indicated Levene's test ($ps > .05$) was met in all cases.

Pre- to post-test effect sizes were calculated using Cohen's *d*, with cut offs of 0.20, 0.50, and 0.80 representing small, medium, and large effect sizes, respectively (Cohen, 1988). The omnibus main and interaction effect sizes using Cohen's *f* were also calculated, with cut offs of 0.10, 0.25, and 0.40 representing small, medium, and large effect sizes, respectively (Cohen, 1988). In a post-hoc sensitivity power analysis using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009), the sample size was determined to be sufficiently large to detect small to medium interaction effect sizes ($f = 0.17$) with the mixed design ANOVA, given an alpha level of .05 and power level of .80.

3.2. Main Analyses

A series of 2 (Group: self-compassion, guided imagery) × 2 (Time: pre- and post-test) mixed design ANOVAs was used to assess whether there were significant differences on the outcome measures. Table 3 presents the pre- and post-test mean scores and main and interaction effects. There were significant main effects of Time for self-compassion and body appreciation, both of which significantly increased from pre- to post-test with medium omnibus effect sizes of $f = 0.38$ and 0.31 respectively. There was also a significant main effect of Time for body shame, which significantly decreased from pre- to post-test with a medium effect size of $f = 0.29$. Notably, however, the Cohen's *d* effect sizes calculated for the pre- to post-test effects within each group, separately, were in the

Table 3
Pre- and Post-Test Means, Standard Deviations, and Effects for Self-Compassion and Guided Imagery Groups

Outcome	Self-compassion (n = 37)			Guided imagery (n = 33)			Effect	F	p	f
	Pre-test M (SD)	Post-test M (SD)	d	Pre-test M (SD)	Post-test M (SD)	d				
Self-compassion	2.96 (0.67)	3.11 (0.66)	0.34	2.83 (0.68)	3.01 (0.72)	0.44	Time	10.56	**.002**	0.39
							Group	0.63	.431	0.10
							Time × Group	0.01	.784	0.03
Body appreciation	3.49 (0.76)	3.61 (0.68)	0.27	3.33 (0.71)	3.46 (0.67)	0.33	Time	6.42	**.014**	0.31
							Group	0.92	.341	0.12
							Time × Group	0.60	.807	0.03
Body shame	3.75 (1.03)	3.60 (0.97)	0.22	3.74 (1.25)	3.48 (1.30)	0.34	Time	5.43	**.023**	0.29
							Group	0.05	.819	0.03
							Time × Group	0.38	.542	0.08
Appearance contingent self-worth	4.77 (1.06)	4.72 (1.10)	0.07	4.82 (0.84)	4.70 (0.91)	0.15	Time	0.88	.352	0.12
							Group	0.01	.944	0.03
							Time × Group	0.12	.732	0.04

Note. Significant effects at $p < .05$ are in boldface.

small range for the significant effects (see Table 3). None of the remaining effects were significant.

3.3. Post-Hoc Analyses

Given the high attrition rate, a logistic regression was conducted to assess whether various factors (previous meditation experience, community member or student, level of education, BMI, and baseline levels of body image) were related to whether or not participants completed all elements of the study. None of these factors were significantly associated with attrition. The results of the logistic regression are displayed in Tables S1 and S2, provided in the Supplementary Materials.

An additional analysis including partial completers was also conducted to account for potential bias associated with participant attrition and the full results are provided in Table S3 in the Supplementary Materials. When including participants who had completed at least one meditation (N = 89), the main effect of Time for body shame was no longer significant, $F(1,86) = 3.09$, $p = .082$, $f = 0.19$. The remaining effects did not differ from the per-protocol analysis.

To explore potential differences in change for the various subcomponents of self-compassion, we also conducted post-hoc ANOVAs. Significant main effects of Time were found for the Self-Kindness; $F(1,69) = 5.91$, $p = .018$, $f = 0.30$; Common Humanity; $F(1,69) = 4.99$, $p = .029$, $f = 0.27$; and Over-Identification; $F(1,69) = 14.74$, $p < .001$, $f = 0.47$, Subscales. There were no significant effects of Group, or Group x Time. The full results of these analyses are provided in Table S4.

4. Discussion

This study examined the effects of self-compassion meditations, compared with guided imagery meditations, on women's self-compassion and body image. Both groups significantly improved on trait self-compassion, body appreciation, and body shame. However, no changes were found for appearance-contingent self-worth. These findings suggest that meditations can elicit at least short-term improvements in the body image of young women, but both self-compassion and guided imagery are similarly effective.

The improvements across body appreciation and self-compassion are consistent with past research (Albertson et al., 2015; Seekis et al., 2017; Stern & Engeln, 2018; Toole & Craighead, 2016), which suggests that these components are responsive to self-compassion meditation interventions. While Albertson et al. (2015) reported within-group effect sizes in the medium range, it is noteworthy that the equivalent effects in the present study were in the small range, similar to Toole and Craighead's (2016) study. It may be that the longer 3-week study duration, used in Albertson et al.'s study, is influential in achieving larger improvements. However, compared with Toole and Craighead, the findings also suggest that exposing participants to only two, rather than three, self-compassion meditations did not compromise improvements. Improvements to body shame were found in the present study similarly to Albertson et al. but not Toole and Craighead, whose sample reported lower body shame pre-intervention. Contrarily, we found no change in appearance-contingent self-worth, while both other studies demonstrated significant decreases (Albertson et al., 2015; Toole & Craighead, 2016). This difference may also be explained by pre-intervention scores, with our participants reporting lower appearance-contingent self-worth prior to the intervention.

There are several potential explanations for the lack of difference between the two types of meditation. Both self-compassion and guided imagery include components of mindfulness, particularly muscle relaxation, breathing techniques, and non-judgemental awareness. In young adult women, past research has found that mindfulness is associated with lower levels of body shame (Lamont, 2019) and mindfulness-based training has been shown to improve weight and appearance satisfaction (Atkinson & Wade, 2012) and reduce eating disorder symptoms (Atkinson & Wade, 2016). Theoretical perspectives further suggest that awareness of internal body feeling and function is connected to body image (Avalos & Tylka, 2006). Indeed, Todd, Aspell, Barron, and Swami (2019) found those who were more mindful of internal body functions had higher levels of body appreciation. Therefore, the mindfulness elements of both meditations may contribute to body image improvements by indirectly increasing awareness of internal body functions through breathing and relaxation, promoting a balanced view that does not exaggerate perceived flaws or over-emphasise physical appearance (Neff, 2003a).

It is important to acknowledge other explanations. It may be that other components of each meditation type independently improve body image, such as the self-compassion component and the focus on a naturalistic environment. A focus on naturalistic peaceful settings may improve one's mood and shift one's perspective off appearance, thus improving body image. Indeed, research has shown that exposure to short films of walks through nature can improve state body appreciation (Swami, Barron, & Furnham, 2018) and photographs of natural environments can result in improved state body image (Swami, Pickering, Barron, & Patel, 2018). Recently, Swami et al. (2019) also found significant direct paths from nature exposure to both body appreciation and functionality appreciation. Two facets of self-compassion, common humanity and self-kindness, mediated the relationship between exposure to nature and both body appreciation and functionality

appreciation (Swami et al., 2019), which corresponds to our post-hoc analysis demonstrating improvements in these two facets. However, it is unclear how long the immediate state benefits found in these studies persist and whether they may have accounted for the long-term trait-based benefits seen in our findings.

Placebo effects, demand characteristics, and expectancy effects are, however, also potential explanations for the findings. An active control group was used in this study to control for shared qualities between the meditations that are not related to self-compassion, such as a soothing voice, delivery format, and the guided aspect. The study did not include a waitlist control group and therefore the improvements in body image in the self-compassion and guided imagery groups could not be isolated from possible demand effects present in both groups. For ethical reasons, it was disclosed to participants that the study was about body image, and involved self-compassion and guided imagery meditations, and therefore may have responded in a way that confirmed their interpretation of the experiment's purpose. All participants were given the same information so demand effects would be the same across groups.

Despite the short timeframe, there was still a high attrition rate and a large number more participants than required for the analysis had to be recruited. This finding suggests that completing pre- and post-intervention sessions in person may explain Toole and Craighead's (2016) low attrition rate rather than the reduced study duration. Whilst high dropout rates often occur in placebo groups (Streiner, 2008), such effects mirror the patterns of use of Internet-based self-help in day-to-day life for many individuals (Eysenbach, 2005). Regression analysis revealed that neither previous meditation experience, being a community member or student, level of education, BMI, nor baseline levels of body image was associated with completion of the study. Furthermore, there were similar dropout rates between groups in this study, suggesting no selective attrition. It remains possible that those who completed the study were more motivated to change their body image and as a result were more likely to have enjoyed the meditations. Based on the post-hoc results that participants still improved in self-compassion and body appreciation after only engaging in one meditation, it is also possible that some participants felt that they already improved after one meditation and did not complete the second. More research is needed to investigate the characteristics (e.g., motivation to change) of those who find meditations engaging. Time commitment may also be a reason for attrition, and therefore these meditations may be shortened in length in order to increase participant engagement.

Another limitation is that participants completed the post-test questionnaire between 7 and 16 days after the initial questionnaire. This large range reflects that participants who did not open meditation emails were sent a reminder, prompting re-engagement in the study. To maximise inclusion, no participants were removed from the analyses on this basis. Given that the ranges were similar across the groups, the duration was unlikely biased based on group. As an additional limitation, it is important to note the potential short-term nature of improvements, given that the study did not include a longitudinal follow-up. Future work needs to investigate whether a short intervention is able to maintain improvements in self-compassion and body image over time similarly to Albertson et al. (2015) following their 3-week study. We also note the minimal ethnic diversity in this study, which may reduce the generalisability of results.

The current study contributes to the growing literature on self-compassion and body image in women. To the authors' knowledge, this study was the first to compare the effects of self-compassion and guided imagery meditations on body image. The findings suggest that even brief exposure to self-compassion and guided imagery meditations can improve facets of body image among women. Examining the evidence base for these approaches may have practical implications; self-compassion and guided imagery meditations are easily accessible, online, and cost-effective interventions. These findings may also have theoretical implications. For example, the common elements, such as breathing and muscle relaxation, between both self-compassion and guided imagery could explain improvements. Future studies may examine the relationship between self-compassion, guided imagery, and body image with the inclusion of an additional (passive) control group to address the extent to which placebo and expectancy effects influence the results. As to whether self-compassion has unique benefit beyond guided imagery is open to further investigation.

Declaration of Competing Interest

None.

CRediT authorship contribution statement

Amy J. de Wet: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing - original draft, Writing - review & editing, Visualization. **Ben R. Lane:** Conceptualization, Methodology, Formal analysis, Writing - review & editing, Visualization, Supervision. **Kate E. Mulgrew:** Conceptualization, Writing - review & editing, Supervision.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:10.1016/j.bodyim.2020.07.009.

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