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Efficacy of an Online Self-Compassion Training for Improving Well-being and Body Image:
A Randomized Waitlist-Controlled Trial

Lauren Benyo Linford

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Master of Science

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ABSTRACT

Efficacy of an Online Self-Compassion Training for Improving Well-being and Body Image: A Randomized Waitlist-Controlled Trial

Lauren Benyo Linford
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Master of Science

This study examined the efficacy of the My Best Self 101 (MBS101) self-compassion module, an internet-delivered self-compassion training within a non-clinical general population sample. Using a randomized-waitlist control design, this study examined whether module participants experienced significant improvements in self-compassion, well-being, and body image compared to waitlist controls. Participants were 228 adults (mean age 30.3, 23.5% male and 76.5% female). At pretest and posttest, both groups completed self-report measures of self-compassion, subjective well-being, and body image. Repeated measures mixed model analyses revealed that compared to waitlist controls, participants who used the MBS101 self-compassion module reported significant improvements in self-compassion, well-being, and body image with effect sizes ranging from medium to large. These results lend evidence to support the MBS101 self-compassion module as a promising resource to improve well-being and body image. Future research should examine its efficacy in different populations and focus on expanding its content.

Keywords: self-compassion, subjective well-being, body image, online intervention

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TABLE OF CONTENTS

LIST OF TABLES	v
LIST OF FIGURES	vi
Efficacy of an Online Self-Compassion Training for Improving Well-being and Body Image.....	1
Positive Correlates of Self-Compassion	2
Self-Compassion Based Treatment Interventions.....	3
An Internet-Based Approach to Treatment Delivery	4
Study Aims and Hypotheses	5
Method	6
Participants.....	6
Procedures.....	8
Intervention.....	9
Measurement.....	10
Self-Compassion Scale, Short Form.	11
Self-Compassion Measure.	11
Survey on Flourishing (SURF).	12
Satisfaction with Life Scale (SWLS).....	12
Body Shape Questionnaire, Short Form (BSQ-16b).....	13
Body Compassion Scale (BCS).	14
Analyses	14
Power analysis.	14
Data Analysis.	14
Results.....	15
Hypothesis 1: Outcomes of Treatment Group Versus Waitlist Control Group	16
Hypothesis 2: Increased Self-Compassion as a Mechanism of Change	18
Hypothesis 3: Time-Dosage Effect for Treatment Group Outcomes	19
Qualitative Observations and Participant Feedback	20
Discussion	21
Study Conclusions	21
Limitations	23
Future Directions	25
References.....	26

LIST OF TABLES

Table 1 Description of Sections of the MBS101 Self-Compassion Module	10
Table 2 Pairwise Correlations Between Variables.....	17
Table 3 Treatment Effects by Group Based on Mixed Model Results	17
Table 4 Indirect and Total Effect and Proportion of Total Effect Mediated by Changes in Reported Self-Compassion	19
Table 5 Effect of Total Practice Minutes on Treatment Gains	20

LIST OF FIGURES

Figure 1 Flowchart of Randomized Design1

Efficacy of an Online Self-Compassion Training for Improving Well-being and Body Image:

A Randomized Waitlist-Controlled Trial

The construct of self-compassion was first conceptualized in the context of Western psychology less than two decades ago by researcher Kristin Neff (2003a). The idea, however, has existed in Buddhism and Eastern philosophy for centuries. Self-compassion is defined as an attitude of kindness and positivity toward oneself, even in the face of failures and personal shortcomings (Zessin et al., 2015). Those who are self-compassionate are keenly aware of their own suffering and seek to assuage their suffering rather than avoid or intensify it (Neff, 2003a).

Self-compassion is widely studied and measured based on Neff's (2003a) conceptualization which identifies three core components: self-kindness, common humanity, and mindfulness (Muris & Petrocchi, 2017; Yarnell et al., 2015; Zessin et al., 2015). Self-kindness is the ability to be kind and understanding toward oneself when faced with failure or personal weakness, rather than indulging in judgement or self-criticism. Common humanity comprises a feeling of connectedness to others who suffer as well as an ability to see one's own suffering as a normal part of the human experience. Mindfulness in the context of self-compassion is the capacity to remain mindfully aware of one's own negative thoughts and emotions and refrain from overidentifying with them (Neff, 2003b). While each of these components is its own distinctly defined construct, they are closely related and build upon each other. For example, being mindfully aware of and not over-identifying with one's negative thoughts and feelings might increase one's capacity to refrain from judgement or self-criticism. Likewise, extending kindness to oneself may increase one's likelihood of reaching out for support from others and recognizing suffering as a common human experience (Neff, 2003a).

Positive Correlates of Self-Compassion

Recent research has found self-compassion to have a myriad of positive correlates. Increased positive affect, emotional intelligence, goal setting behaviors, internal motivation, social connectedness, acceptance following difficult life events, and well-being are positively associated with self-compassion (Barnard & Curry, 2011; Germer & Neff, 2013). Likewise, self-compassion is negatively associated with psychopathology, including anxiety and depression, negative affect, sadness, self-consciousness, rumination, worry, thought suppression, procrastination, maladaptive perfectionism, and body dissatisfaction (Barnard & Curry, 2011).

The field of positive psychology is known for its initiative in expanding the scope of psychological research beyond understanding and treating psychopathology and human suffering. Instead, the aim of positive psychology is to promote well-being within both clinical and non-clinical samples. Subjective well-being can be defined as optimal well-being expressed by one's sense of perspective in life, positive connections with others, and engagement with one's environment to create meaning and purpose (Seligman, 2011). A number of studies have found self-compassion to be associated with well-being in undergraduate and adult samples from the general population (Barnard & Curry, 2011; Breines & Chen, 2012; MacBeth & Gumley, 2012; Neff et al., 2007). A recent meta-analysis by Zessin and colleagues (2015) reviewing 12 different studies found a significant correlation between self-compassion and psychological well-being ($r = .62, p < .01$). A study performed on a sample of 83 female university athletes also found self-compassion to be strongly associated with subjective well-being ($r = .76, p < .01$) (Ferguson et al., 2014). All studies used Neff's (2003b) conceptualization and Self-Compassion Scale. Taken together, it can be inferred that self-compassion is associated with higher subjective well-being in the general population.

Self-compassion is also associated with higher body satisfaction. Body dissatisfaction is a well-established risk factor for the development of eating disorders like anorexia and bulimia and can be a source of profound suffering (Keel & Forney, 2013). Because self-compassion enables a person to accept him or herself despite perceived flaws, self-compassionate people are able to see past their own physical imperfections. Research suggests that self-compassion is a protective factor against both body dissatisfaction and disordered eating (Braun et al., 2016). Additionally, self-compassion has been found to protect against body comparison and the internalization of thin-ideal media (Magnus et al., 2009). These findings highlight the positive association between self-compassion and body image.

It is important to note that the majority of the studies reporting these outcomes associated with self-compassion rely solely on self-report measures and cannot establish causality because of their correlational and cross-sectional design (Barnard & Curry, 2011). Nevertheless, the question of a causal relationship highlights the need for research implementing interventions that increase self-compassion to examine its effects on well-being and body dissatisfaction.

Self-Compassion Based Treatment Interventions

Several self-compassion-based interventions have been found to increase well-being and improve body image in non-clinical samples. Several recent self-compassion programs have been implemented in clinician-led group settings with general population samples. One such program that appears promising is Neff and Germer's (2013) Mindful Self-Compassion (MSC) program. In a randomized controlled trial of the program, a group of 25 people from the community met for 2.5 hours per week over a period of 8 weeks to receive training in informal self-compassion practices and self-compassion focused meditation. The program effectively increased reports of self-compassion and well-being compared to waitlisted controls (Neff &

Germer, 2013; Germer & Neff, 2013). Smeets et al. (2014) also used a group approach to teach self-compassion skills to a sample of female college students and saw significant increases in self-compassion (large effect size) and life satisfaction (small effect size). The results of these studies suggest that group-focused implementation of self-compassion interventions may be an efficient efficacious alternative to traditional individual therapy in non-clinical samples.

A few recent studies have also been conducted examining the effects of self-compassion interventions on body image. A recent study by Albertson and colleagues (2015) implemented a randomized-waitlist control trial of an internet-delivered deliver self-compassion meditation interventions focused on improving body. A sample of online-recruited participants were instructed to independently listen to several self-compassion guided meditations over a period of weeks. Despite a high rate of attrition (over 50%), treatment participants reported significant increases in self-compassion (large effect size) as well as significant decreases in body satisfaction (large effect size) compared to waitlist control participants that were maintained after a 3-month follow-up. Other forms of self-compassion interventions such as writing exercises, workshops, and group interventions have also proved effective in improving self-reported measures of body image compared to control participants (Rodgers et al., 2018; Seekis et al., 2017; Palmeira et al., 2017; Stern & Engeln, 2018). More research is needed, however, to establish effective and efficient self-compassion interventions aimed at improving well-being and body image.

An Internet-Based Approach to Treatment Delivery

Many of the previously cited self-compassion interventions used clinician-implemented delivery methods. Although efficacious, these methods are inefficient and insufficient to adequately meet the vastly growing need for mental health treatment and prevention services.

There is currently a great demand on clinicians to provide face-to-face services to underserved clinical populations with more severe psychopathology and symptomatology. However, skills learned in psychotherapy such as self-compassion can be greatly beneficial for the general, non-clinical population as well. Because it is not feasible to disseminate such resources to everyone in the population through an individualized treatment model, larger scale treatment delivery and prevention models must be considered (Kazdin, 2018). In the last decade, there has been an expansion of research studies focused on feasibility and implementation of internet-delivered interventions for a variety of treatment areas and populations (Christensen et al., 2009). In order to increase the accessibility of self-compassion focused treatment to the general population, there is a strong need for well-established cost-effective internet-delivered self-compassion interventions. Such treatments could help to improve well-being and body image in underserved groups and subclinical samples by providing an affordable alternative to a clinician-led intervention.

Study Aims and Hypotheses

The primary aim of this study was to examine the efficacy of the My Best Self 101 (MBS101) self-compassion module, an online self-compassion training, at improving self-compassion, well-being, and body image in a non-clinical sample through a randomized waitlist-control design. The MBS101 self-compassion module is composed of 1) psychoeducational material about self-compassion gathered by conducting a large-scale literature review and 2) a variety of evidence-based exercises such as self-compassion meditations and writing activities. Unlike many self-compassion focused interventions that require face-to-face direction of a clinician, the MBS101 self-compassion module is self-administered 20 minutes per day over the course of 3 weeks. This online delivery method expands its reach and minimizes costs so that

this training can be available to a wide range of people. This study was designed to test the following hypotheses:

1. Participants assigned to use the module will report significantly greater increases in self-compassion, subjective well-being, and body compassion compared to their waitlisted counterparts. Module users will also report significantly greater decreases in body dissatisfaction than waitlist control participants.
2. Increased self-compassion will act as a mechanism of change for improving subjective well-being and body image. Specifically, reported improvements in self-compassion will mediate the relationship between group assignment and improvements in the outcome variables of subjective well-being and body image.
3. For participants assigned to the treatment group, greater amount of time spent using the MBS101 self-compassion module will predict greater improvements in self-compassion, subjective well-being, and body image.

Method

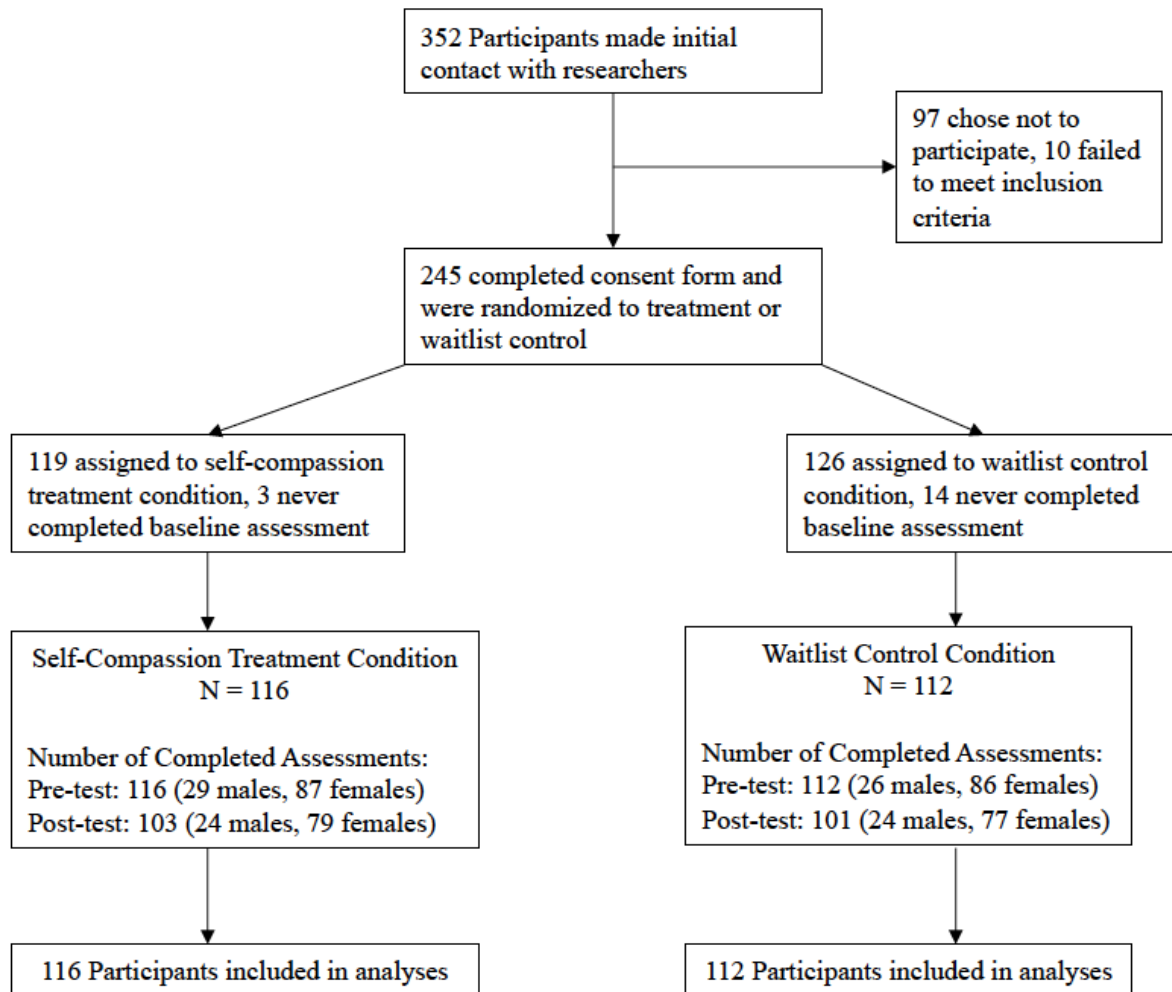
Participants

Participants were recruited from the general population primarily through online advertising during the summer of 2019. Advertisements were posted on various social media platforms including Facebook, Twitter, Instagram, and Reddit. Snowball sampling was also employed. To be included in the study, it was required that each participant be over 18, a native English speaker, and live in the United States. Due to the online nature of the study, participants were also required to have an email account and daily internet access to participate. Additionally, participants were required to pass an attention check survey item on the baseline assessment to

be included in the study. The opportunity to earn up to a \$75 Amazon gift card was offered as an incentive to participate in the study.

Over the course of 3 months, a total of 352 individuals made initial contact with the researchers expressing interest in the study. Of these, 97 ultimately chose not to participate and 10 failed to meet one or more of the inclusion criteria. Altogether, 245 participants completed consent forms and were randomized to either the self-compassion treatment condition or the waitlist control condition (see Fig. 1). A total of 119 participants were assigned to the treatment condition and 126 were assigned to the waitlist control condition. After randomized assignments were given, 3 treatment participants and 14 control participants failed to complete the baseline assessment and were not included in the study. A total of 228 participants completed the baseline assessment, 116 from the treatment condition and 112 from the control condition. Attrition was 10.5%, with 103 treatment participants and 101 control participants completing the post-test assessment (see Figure 1). Because analyses with maximum likelihood estimation were utilized, partial data from those who did not complete the post-test assessment were included in analyses and missing data points were imputed. The average age of participants was 30.3 (10.2). Gender distribution of the sample was 23.5% male and 76.5% female. Of those recruited, 65% were from the Mountain West, 10% from the Pacific West, 9% from the South, 8% from the Northeast, and 8% from the Midwest regions of the United States. The sample was 95% Caucasian. Because body image was a variable of interest, participant body mass index was also reported, with an average male BMI of 25.3 (4.9) and an average female BMI of 25.4 (6.5).

Figure 1. Flowchart of randomized design.



Procedures

Online advertisements provided an email address that participants could contact to inquire about the study. After making initial email contact with researchers, participants received additional information and were forwarded a link to an electronic consent form. Participation required a 3-week commitment and participants were allowed to choose a date within a four-month period that would be most convenient for them to begin the study. Group assignments were made through computer-generated randomization. Matched-pair randomization based on

gender was used in order to ensure equal gender distribution between groups. After receiving a group assignment, participants were then emailed a link to complete a baseline assessment at the beginning of their selected 3-week period. Participants in the treatment group received an email with further instructions, a link to the website of the self-compassion module, as well as a spreadsheet where they would log the minutes spent completing the module. At the end of three weeks, both treatment and control participants completed a post-test assessment.

Those assigned to the treatment group were incentivized with a prorated compensation system based on the amount of total reported minutes spent completing the online self-compassion intervention over the course of 3 weeks. A \$75 Amazon gift card was given to those who completed over 400 minutes, a \$50 gift card to those who completed 300-400 minutes, a \$25 gift card to those who completed 100-300 minutes, and a \$10 gift card to those who completed less than 100 minutes. Participants assigned to the control group were compensated with a \$10 Amazon gift card upon completing the post-test assessment.

Intervention

The MBS101 Self-Compassion module contains a combination of self-compassion psychoeducation and empirically supported exercises as outlined in Table 1. Both psychoeducational and practice materials were gathered based on a large-scale literature review on self-compassion and effective self-compassion interventions. Participants were expected to use the intervention 20 minutes per day for 3 weeks. For the first week, the participant was asked to spend 20 minutes per day completing the psychoeducation portion where they learned what self-compassion is, why it is helpful and how to practice it. For the final two weeks, participants were asked to spend 20 minutes per day practicing various self-compassion strategies and

activities provided by the module. These exercises consisted of a variety of self-compassion guided meditations, writing exercises, and thought exercises.

Table 1

Description of Sections of the MBS101 Self-Compassion Module

Section Title	Description
Self-Compassion	Basic overview and introduction to self-compassion
Self-Compassion Questionnaire	Self-compassion questionnaire that allows the participant to evaluate their current levels of self-compassion and receive a normative score
What is Self-Compassion?	Psychoeducational material about what self-compassion is. Includes a writing exercise and YouTube video.
Building Blocks of Self-Compassion	Introduces the three components of self-compassion: self-kindness, mindfulness, and common humanity.
Resistance and Acceptance	Discusses the role of emotional acceptance in self-compassion. Provides YouTube videos that illustrate this concept.
What Self-Compassion is Not	Discusses several common misconceptions about what self-compassion is. Common misconceptions include self-indulgence, narcissism, and self-pity.
Benefits of Self-Compassion	Outlines some of the positive correlates and benefits of self-compassion based on peer-reviewed literature.
Self-Compassion Strategies	Provides a menu of different self-compassion strategies and practices including meditations, writing exercises, and thought exercises.
Personal Experiment	Outlines the structure of the 3-week intervention, the amount of time to spend on psychoeducation vs. practice, and how to track progress.
Self-Compassion Resources	Provides several links to helpful external sources, websites and YouTube videos related to self-compassion.

*The module can be accessed at <https://www.mybestself101.org/self-compassion>

Measurement

The outcomes of interest in this study were self-compassion, subjective well-being, and body image. Self-compassion was measured with the shortened version of Neff's (2003b) Self-Compassion Scale as well as our own recently developed Self-Compassion Measure. Subjective

well-being was measured with our own recently developed measure called the Survey on Flourishing as well as Diener's (1985) Satisfaction with Life Scale. Body image was measured in two parts with a measure of body dissatisfaction (Body Shapes Questionnaire, Short Form) and a measure of body compassion (The Body Compassion Scale).

Self-Compassion Scale, Short Form. Self-compassion was measured with the 13-item self-report Self-Compassion Scale, Short Form (SCS-SF) (Raes et al., 2011). Items are scored on a 5-point Likert scale with responses indicating the extent to which the examinee responds to suffering and negative thoughts with each of the three facets of self-compassion: self-kindness, mindfulness, and common humanity. Despite a multi-factor structure, Neff (2016) argued for the justification of computing an overall self-compassion score, as 90% of the reliable variance in items was explained by a general self-compassion latent factor. Based on these findings, we scored the scale by taking an average of items to generate an overall score.

The original self-compassion scale was found to have good overall internal consistency ($\alpha=.92$ in the original validation sample). Test-retest reliability was found to be .93 after a 3-week period (Neff 2003b). Scores on the Self-Compassion Scale were found to be negatively correlated with scores from the Self-Criticism subscale of the Depressive Experiences Questionnaire ($r = -.65, p<.01$) and weakly correlated with scores from the Narcissistic Personality Inventory ($r = .11$), indicating proper discrimination (Neff 2003b). The Self-Compassion Scale, short form (Raes et al., 2011) was found to have a nearly perfect correlation to the long form Self-Compassion Scale and replicated the same factor structure.

Self-Compassion Measure. Our original Self-Compassion measure is a 12-item measure with Likert-based items. Respondents are asked to report to what extent they agree with items such as "I am able to offer myself love and validation when I need it" and "I am kind to myself,

especially when I need it most”. The scale was scored by averaging item responses. Recent preliminary findings indicate good internal consistency for the Self-Compassion ($\alpha = .90$) measure as well as evidence for convergent validity as it correlated strongly ($r = .85$) with the Self-Compassion Scale, short form (Raes et al., 2011).

Survey on Flourishing (SURF). The outcome of subjective well-being was measured with the recently developed Survey on Flourishing (SURF). SURF is a 19-item measure with self-report items based on a 7-point Likert scale. Respondents are asked to rate to what extent they agree with items such as “I feel happy and peaceful most of the time” or “The things I do in life are valuable and worthwhile”. The scale was scored by averaging item responses. Recent preliminary findings provide support for the reliability and validity of the SURF. A preliminary internal consistency estimate for SURF was high ($\alpha = .95$). SURF also correlated significantly with other measures of well-being including the PERMA profiler ($r = .79$) (Butler & Kern, 2016), the Satisfaction with Life Scale ($r = .75$) (Diener, 1985) the Positive Affect subscale of the Positive and Negative Affect Schedule (PANAS) ($r = .69$) (Thompson, 2007). SURF scores negatively correlated with the negative affect subscale of PANAS ($r = -.58$), indicating proper discrimination.

Satisfaction with Life Scale (SWLS). Participants also completed the Satisfaction with Life Scale as a measure of subjective well-being (Diener et al., 1985). The SWLS is a brief, 5-item measure with self-report items based on a 7 point likert scale. Respondents are asked to rate to what extent they agree with items such as “ I am satisfied with my life” or “ If I could live my life over, I would change almost nothing”. Cronbach’s alpha estimates of internal consistency for the SWLS range from .79 to .89 (Pavot & Diener, 1993). Test-retest reliability was found to be .83 after a period of 2 weeks and .84 after a period of one month (Alfonso et al., 1996; Pavot et

al., 1991). Groups expected to report low life satisfaction (abused women, prison inmates, and psychiatric patients) scored low on the SWLS. Convergent validity of the SWLS is evidenced by its correlation with other measures of well-being including the Andrews/Withey Scale ($r = .52-.68$), the Fordyce Global Scale ($r = .55-.82$), as well as interviewer ratings ($r = .43-.66$) and informant reports of well-being ($r = .28-.58$) (Diener et al., 1985; Larsen et al., 1985; Pavot et al., 1991; Pavot & Diener, 1993). The SWLS was originally validated based on a sample of 176 undergraduate students (Diener et al., 1985).

Body Shape Questionnaire, Short Form (BSQ-16b). The Body Shape Questionnaire, Short Form B was used to measure participant body dissatisfaction (Evans & Dolan, 1993). The BSQ-16b is a shortened, 16 item version of the Body Shape Questionnaire (Cooper et al., 1987) and asks things like “Have you noticed the shape of other women and felt that your own shape compared unfavorably?” and “Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?” The BSQ uses a 6-point Likert scale and respondents are asked to identify the frequency with which they endorse each item based on their experiences in the last four weeks (Evans & Dolan, 1993). For the purpose of this study, the scale was scored by averaging item responses. The scale was found to have high internal consistency (Cronbach's $\alpha = .96$) in a sample of 192 women (Evans & Dolan, 1993). The BSQ has convergent validity as indicated by its positive correlation with measures of disordered eating, self-reported BMI, and weight category (Evans & Dolan, 1993). The scale was originally validated with a sample of non-clinical females recruited from a family planning clinic (Evans & Dolan, 1993). With the removal of gendered language, the BSQ has been found to have reliable and valid application in mixed-gendered samples (Rosen et al., 1996; Conti et al., 2009)

Body Compassion Scale (BCS). Body compassion is the ability to extend kindness and compassion toward one's own body (Altman et al., 2017). The construct is related to both body image and self-compassion and was used as an outcome variable in this study. The BCS consists of 24 items and respondents use a 5-point Likert scale to identify to what extent they endorse statements such as "I am tolerant of the way my clothes fit me" or "I try to see my body's failings as something everyone experiences in one way or another" (Altman et al., 2017). BCS scores are positively correlated with measures of body image and self-compassion and negatively correlated with measures of eating disorder behaviors, suggesting convergent and discriminant validity (Altman et al., 2017). The scale was originally validated with a sample of 662 college-aged men and women (about 70% female) (Altman et al., 2017). For the purpose of this study, the BCS was scored by calculating an average of all items.

Analyses

Power analysis. A priori power analyses were conducted to determine adequate sample size. Using power calculation software G-Power 2, it was determined that sample size would need to be at least 200 (100 per group) in order to detect an effect size of $d = .4$ or greater with an independent group effect size analysis. With this sample size, power estimate would be 80%. The total number of participants who completed both pretest and posttest measures was 204 (103 treatment, 101 control).

Data Analysis. We used a series of mixed models with repeated measures design to examine outcome differences between treatment and control participants and to examine treatment-time interactions. Unlike ANOVA which uses least squares, mixed models use maximum likelihood. An advantage of using a mixed model instead of ANOVA is that it is better equipped to handle missing data. While an ANOVA model would use listwise deletion and

omit observations that did not complete post-test data, a mixed model is more flexible and is able to make use of available data even if some data points are missing (Baldwin, 2019). Missing data from participants who did not complete post-test measures is imputed with maximum likelihood estimations. Effect sizes for treatment outcomes were calculated with Cohen's *d* using post-test data from both groups.

In order to test whether increases in self-compassion acted as a mechanism change in the outcomes of subjective well-being and body image, we used a series of regression-based mediation analyses with structural equation modelling. These analyses tested whether change scores in self-compassion mediated the relationship between group assignment and body image and subjective well-being outcome scores.

Finally, to determine whether the amount of time spent using the module predicted outcomes for treatment participants, we used a series of multiple regression models with total minutes as a predictor of outcome scores. Age, gender, and race were controlled for. Because body mass index is correlated with body dissatisfaction, it is possible that BMI may influence the relationship between self-compassion and body image. Consequently, we included BMI as a covariate in our analyses (Albertson et al., 2015). All analyses were completed with Stata 16.

Results

Prior to conducting analyses, the data were cleaned and prepared. Examining individual variable distributions by timepoint and group assignment, we then screened the data for outliers (which we defined as any data point beyond the range of median plus or minus 2 interquartile ranges). In total, 17 data points were fenced to these limits. Because significant attrition occurred in this study, data were screened to ensure that the missing observations were random. Missingness was not significantly correlated with any of our outcome or predictor variables,

suggesting that the data were missing completely at random (MCAR). The data were also screened for normality and no significant normality issues were identified.

Hypothesis 1: Outcomes of Treatment Group Versus Waitlist Control Group

Pairwise correlation coefficients suggested significant positive correlation between the outcome variables of self-compassion, well-being, and positive body image (see Table 2). A series of mixed models were used to examine treatment effects over time between groups. Controlling for age, gender, race, and BMI, results suggested significant treatment-time interactions for all outcomes including self-compassion, well-being, body dissatisfaction, and body compassion. Compared to waitlist controls, participants who completed the self-compassion module experienced significant increases in self-compassion, well-being, and body compassion as well as significant decreases in body dissatisfaction. Effect sizes were large for measures of self-compassion ($d = 1.3-1.4$), well-being ($d = .74$), and body compassion ($d = .74$) and medium for life satisfaction ($d = .58$). As hypothesized, body dissatisfaction decreased with a medium effect size ($d = -.51$). Table 3 provides pretest and posttest mean scores on each outcome variable by group, F-values for treatment-time interactions calculated from the repeated measures mixed models, and Cohen's d effect sizes calculated from treatment vs. control posttest data. Of note, scores for waitlist controls improved slightly from pretest to posttest on each measure, however, none of these increases were statistically significant ($p > .05$).

Table 2
Pairwise Correlations Between Variables

	SC (Neff)	SC (Orig.)	WB (SURF)	LS	BC	BD
Self-Compassion (Neff Measure)	1					
Self-Compassion (Original Measure)	.85*	1				
Well-being (SURF)	.67*	.67*	1			
Life Satisfaction	.48*	.53*	.75*	1		
Body Compassion	.72*	.73*	.58*	.47*	1	
Body Dissatisfaction	-.50*	-.51*	-.38*	-.37*	-.71*	1

** $p < .001$

Table 3
Treatment Effects by Group Based on Mixed Model Results

Outcome	Treatment Group		Waitlist Controls		<i>F</i>	<i>d</i>
	Pretest <i>M(SD)</i>	Posttest <i>M(SD)</i>	Pretest <i>M(SD)</i>	Posttest <i>M(SD)</i>		
Self-Compassion (Neff Measure)	2.71 (.69)	3.64 (.53)	2.74 (.63)	2.88 (.63)	156.26**	1.3
Self-Compassion (Original Measure)	6.57 (.91)	5.01 (.86)	3.54 (.94)	3.72 (.93)	145.41**	1.4
Well-being (SURF)	4.67 (1.0)	5.38 (.77)	4.57 (1.1)	4.72 (1.0)	47.54**	.74
Life Satisfaction	4.59 (1.3)	5.51 (.92)	4.65 (1.4)	4.84 (1.35)	45.57**	.58
Body Compassion	2.75 (.76)	3.60 (.64)	3.03 (.76)	3.10 (.72)	142.50**	.74
Body Dissatisfaction	3.00 (1.1)	2.16 (.72)	2.81 (1.0)	2.61 (1.0)	65.12**	-.51

** $p < .001$

Hypothesis 2: Increased Self-Compassion as a Mechanism of Change

A series of SEM-based mediation models controlling for age, gender, race, and BMI were then used to examine whether gains in self-compassion mediated the relationship between group assignment and well-being/body image outcomes. These analyses used change scores which were calculated by subtracting pretest from posttest scores on each measure. Unstandardized direct, indirect, and total effects of group assignment were then estimated. For well-being, the indirect effect of group assignment through self-compassion gains was statistically significant, while the direct effect was not statistically significant, with 83% of the total effect mediated by self-compassion gains. For body compassion, both the indirect effect and direct effect were statistically significant (though the direct effect was smaller, with a ratio of indirect to direct of 1.7). Additionally, 62% of the total effect was mediated by self-compassion gains. For body dissatisfaction, both the indirect and direct effect were statistically significant (though the direct effect was smaller, with a ratio of indirect to direct of 1.5). Additionally, 61% of the total effect was mediated by self-compassion gains. Table 4 includes unstandardized direct, indirect, and total effects of self-compassion gains on each outcome variable with a 95% confidence interval as well as the proportion of the total effects mediated by self-compassion gains. These results indicate that gains in self-compassion may fully mediate the relationship between group assignment and gains in well-being and partially mediate the relationship between group assignment and improvements in body compassion and body dissatisfaction.

Table 4

Indirect and Total Effect and Proportion of Total Effect Mediated by Changes in Reported Self-Compassion

Outcome	Indirect Effect with 95% CI	Total Effect with 95% CI	Proportion of total effect mediated
Well-being	.50** (.35 - .66)	.60** (.43 - .77)	.83
Body Compassion	.53** (.40 - .65)	.85** (.71 - .98)	.62
Body Dissatisfaction	-.43** (-.58 - -.28)	-.70** (-.87 - -.54)	.61

** $p < .001$

* $p < .01$

Hypothesis 3: Time-Dosage Effect for Treatment Group Outcomes

Our third hypothesis that greater amount of time spent using the MBS101 self-compassion module would predict greater improvements in self-compassion, well-being, and body image was tested with a series of regression models using total practice minutes as a predictor. Age, gender, race, and BMI were controlled for in the models and gain scores of well-being, self-compassion, body compassion, and body dissatisfaction were used as the outcome variables. Results from these regression analyses indicated that the number of total minutes spent using the modules significantly predicted gains in self-compassion and body compassion but did not predict meaningful differences in well-being or body dissatisfaction. Table 5 shows standardized beta coefficients and R^2 values for the models (including covariates).

Table 5
Effect of Total Practice Minutes on Treatment Gains

	β Coefficient	R^2
Self-Compassion	.21*	.12
Well-being	.05	.03
Body Compassion	.29**	.18
Body Dissatisfaction	-.05	.20

* $p < .05$

** $p < .01$

Because most participants (59.2%) completed between 400-500 minutes, with only 13.6% of participants completing less than 400 minutes, the total required to receive full compensation, there may not have been enough variation in practice minutes for this to meaningfully predict treatment outcomes.

Qualitative Observations and Participant Feedback

Reports from participants in the group that used the self-compassion module suggested that the majority of participants spent the first week reading the psychoeducational portion of the module and watching related videos. For the experiential portion, the most common exercises that were used were writing self-compassionate letters, completing a self-compassion journal, and guided self-compassion meditations such as Kristen Neff's "Soften, Soothe, Allow", Tara Brach's "Rain of Self-Compassion", and various self-compassion or lovingkindness meditations found on meditation smartphone applications such as Insight Timer. Participants also provided feedback on the module at the end of the study. General themes of participant feedback included

a desire for more structured course content (e.g. specific assignments and course material for each day of the module and reminders) and more videos and interactive content.

Discussion

Study Conclusions

The purpose of this study was to determine the efficacy of an internet-delivered self-compassion intervention, the My Best Self 101 (MBS101) self-compassion module in a general population sample. Primarily, we wanted to know within the context of a randomized-waitlist control design whether those who used the MBS101 self-compassion module would experience greater improvements in reports of self-compassion, well-being, and body image compared to their waitlisted counterparts. A secondary aim of the study was to examine increases in self-compassion as a potential mechanism of change in the treatment outcomes of well-being and body image. Lastly, the study sought to determine whether the amount of time spent completing the MBS101 module significantly predicted outcomes. By examining these relationships, this study sought to expand current research implementing cost-effective internet delivered self-compassion interventions to improve well-being and body image.

The results of this study mostly confirmed our initial hypotheses. Measured outcomes included self-reported self-compassion, well-being, body compassion and body dissatisfaction. Results of analyses showed significant treatment-time interactions for all four treatment outcomes. This finding suggests that treatment participants experienced significantly greater improvements in all four outcomes from pretest to posttest compared to the control group, who did not exhibit reliable change over this same period. These results underscore the MBS101 self-compassion module as a potentially promising intervention for improving well-being and body image in non-clinical samples.

Treatment effect sizes were large for self-compassion, well-being, and body compassion and medium for body dissatisfaction after a 3-week period of daily module use. The effects found in this study coincide with the findings of previous self-compassion intervention studies that documented large effect sizes for self-compassion ($d = .82-1.67$), small to medium effect sizes for well-being or life satisfaction ($d = .3-.51$), and a large effect size for body dissatisfaction ($d = .73$) (Smeets et al., 2014; Albertson et al., 2015; Neff & Germer, 2013). Baseline self-compassion scores in the present study (experimental group $M = 2.71$; control group $M = 2.74$) were comparable to baseline self-compassion scores of previous self-compassion intervention studies study in other non-clinical general population samples (experimental group $M = 2.65$; control group $M = 2.62-2.75$) (Albertson et al., 2015; Neff & Germer, 2013).

A secondary hypothesis, that self-compassion change scores would mediate the relationship between group assignment and gains in well-being and body image was partially supported by results. Results from the mediation analyses indicated that self-compassion gains fully mediated the relationship between group assignment and well-being while partially mediating the relationship between group assignment and body image outcome variables. These results support self-compassion as a potential mechanism of change in the treatment-outcome relationship for both well-being and body image. Much of the previous research on self-compassion and well-being or body image has been cross-sectional and correlational in nature, with a well-established association between self-compassion and these outcomes (Barnard & Curry, 2011). It has been less clear, however, whether a causal relationship may be implicated, with improvements in self-compassion leading to improvements in well-being or body image. The results of this study provide some support for the possibility of a causal relationship, as they

seem to suggest that using the MBS101 module improved self-compassion which in turn led to improvements in well-being and body image.

Our final hypothesis that the total minutes spent using the MBS101 module would significantly predict treatment outcomes was only partially supported. Although total minutes did predict differences in self-compassion and body compassion, it did not significantly predict differences in outcomes for well-being or body dissatisfaction. This may be explained by a restriction of range in practice minutes which limits this as a meaningful predictor. The results might also suggest that the amount of time spent using the MBS101 module was less important than whether or not the intervention was used at all. Such conclusions could be informative to treatment delivery which might aim to focus on consistency of self-compassion practice rather than the total amount of time spent practicing.

Limitations

This study had several limitations that warrant further discussion. A primary limitation to the study was the sampling methodology and homogeneity of the sample. Because of the anonymous nature of internet recruitment, it was found that public online posts resulted in some spam-related or otherwise fraudulent inquiries. In order to avoid this, the majority of recruitment efforts consisted of posting advertisements on the social media platforms of our research group as well as the researchers' personal social media accounts. Snowball sampling was also utilized as recruited participants shared the study advertisements with friends or family. This sampling methodology resulted in a mostly homogenous sample, with 95% of the participants being Caucasian and 65% of participants being from the mountain west region of the United States. It is unclear how these results would generalize to a more diverse sample.

A second limitation of the study was attrition. Previous studies implementing internet-delivered interventions have reported very high attrition rates, oftentimes over 50% (Christensen et al., 2009). Attrition for this study did not approach these upper limits, however dropout was still significant at 10.5% from pretest to posttest. Although it was determined that missingness was random and not systematically related to demographic or outcome variables, it is possible that effect sizes may have been different had these participants completed post-test measures. There were several measures taken to prevent attrition, including sending weekly reminder emails and using a prorated incentive program to encourage retention. We suspect that treatment attrition would be much higher in the absence of these efforts. Research is needed to evaluate the feasibility of treatment completion for the MBS101 self-compassion module implemented without research compensation.

A third limitation of the study is that it did not take clinical concerns into account. It is assumed that participants included in this study were a non-clinical sample from the general population, however participants were not screened for any clinical or psychiatric diagnoses. In fact, an independent sample t-test indicated that treatment participants exhibited significantly greater body dissatisfaction at baseline despite randomization. This distinction suggests the possibility of clinical concerns that may have existed within the sample. Further research is also needed to determine the efficacy of the MBS101 module in treating clinical versus subclinical concerns with body image and well-being.

Finally, each of the outcomes in the study were measured with a single self-report scale. In order to minimize measurement error, it is ideal that hypothetical construct variables be assessed with multiple methods of measurement. However, because the study was conducted

online, self-report was the most feasible method of outcome measurement. Conclusions should be drawn circumspectly acknowledging the presence of measurement error.

Future Directions

Despite these limitations, the results of this study point to the MBS101 self-compassion module as a possibly promising intervention to improve body image and well-being in the general population. Future research should focus on replicating the results of this study as well as identifying other populations for which the module may be most effective. Such populations might include clinical samples such as people with eating disorders, depression, anxiety, or other psychiatric concerns. Subclinical populations of interest might include people with body image concerns or subclinical life dissatisfaction. Additionally, future research might consider treatment efficacy with child or adolescent samples.

The study also involved collecting qualitative data and feedback from participants about their experience using the MBS101 module. Common feedback included a desire for a more structured course with time-bound assignments and more interactive content. Future research should include further development of the MBS101 self-compassion module by expanding it into an online course with enhanced structure and content. This development would aim to increase treatment engagement and accountability while minimizing treatment attrition.

References

- 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.
- Alfonso, V. C., Allison, D. B., Rader, D. E., & Gorman, B. S. (1996). The extended satisfaction with life scale: Development and psychometric properties. *Social Indicators Research, 38*(3), 275-301.
- Altman, J. K., Linfield, K., Salmon, P. G., & Beacham, A. O. (2017). The body compassion scale: Development and initial validation. *Journal of Health Psychology, 25*(4), 439-449.
- Baldwin, S. A. (2019). *Psychological statistics and psychometrics using Stata*. College Station, TX: Stata Press.
- Barnard, L. K., & Curry, J. F. (2011). Self-compassion: Conceptualizations, correlates, & interventions. *Review of General Psychology, 15*(4), 289–303.
- Braun, T. D., Park, C. L., & Gorin, A. (2016). Self-compassion, body image, and disordered eating: A review of the literature. *Body Image, 17*, 117–131.
- Breines, J. G., & Chen, S. (2012). Self-compassion increases self-improvement motivation. *Personality and Social Psychology Bulletin, 38*(9), 1133–1143.
- Butler, J., & Kern, M. L. (2016). The PERMA-Profil: A brief multidimensional measure of flourishing. *International Journal of Wellbeing, 6*(3).
- Christensen, H., Griffiths, K. M., & Farrer, L. (2009). Adherence in internet interventions for anxiety and depression: Systematic review. *Journal of Medical Internet Research, 11*(2), e13.

- Conti, M. A., Cordás, T. A., & Latorre, M. D. R. D. D. (2009). A study of the validity and reliability of the Brazilian version of the Body Shape Questionnaire (BSQ) among adolescents. *Revista Brasileira de Saúde Materno Infantil*, 9(3), 331-338.
- Cooper, P. J., Taylor, M. J., Cooper, Z., & Fairbum, C. G. (1987). The development and validation of the Body Shape Questionnaire. *International Journal of Eating Disorders*, 6(4), 485-494.
- Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71-75.
- Evans, C., & Dolan, B. (1993). Body Shape Questionnaire: derivation of shortened “alternate forms”. *International Journal of Eating Disorders*, 13(3), 315-321.
- Ferguson, L. J., Kowalski, K. C., Mack, D. E., & Sabiston, C. M. (2014). exploring self-compassion and eudaimonic well-being in young women athletes. *Journal of Sport and Exercise Psychology*, 36(2), 203–216.
- Germer, C. K., & Neff, K. D. (2013). Self-compassion in clinical practice. *Journal of Clinical Psychology*, 69(8), 856–867.
- Kazdin, A. E. (2018). *Innovations in psychosocial interventions and their delivery: Leveraging cutting-edge science to improve the world's mental health*. Oxford University Press.
- Keel, P. K., & Forney, K. J. (2013). Psychosocial risk factors for eating disorders. *International Journal of Eating Disorders*, 46(5), 433-439.
- Larsen, R.J., Diener, E., & Emmons, R.A. (1985). An evaluation of subjective well-being measures. *Social Indicators Research*, 17, 1–18.

- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review, 32*(6), 545-552.
- Magnus, C. M. R., Kowalski, K. C., & McHugh, T.-L. F. (2010). The role of self-compassion in women's self-determined motives to exercise and exercise-related outcomes. *Self & Identity, 9*(4), 363–382.
- Muris, P., & Petrocchi, N. (2017). Protection or vulnerability? A meta-analysis of the relations between the positive and negative components of self-compassion and psychopathology. *Clinical Psychology & Psychotherapy, 24*(2), 373–383.
- Neff, K. (2003a). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self & Identity, 2*(2), 85.
- Neff, K. D. (2003b). The development and validation of a scale to measure self-compassion. *Self & Identity, 2*(3), 223.
- Neff, K. D. (2016). The self-compassion scale is a valid and theoretically coherent measure of self-compassion. *Mindfulness, 7*(1), 264-274.
- Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the Mindful Self-Compassion Program: A Pilot and Randomized Trial of MSC Program. *Journal of Clinical Psychology, 69*(1), 28–44.
- Neff, K. D., Kirkpatrick, K. L., & Rude, S. S. (2007). Self-compassion and adaptive psychological functioning. *Journal of Research in Personality, 41*(1), 139–154.
- Palmeira, L., Pinto-Gouveia, J., & Cunha, M. (2017). Exploring the efficacy of an acceptance, mindfulness & compassionate-based group intervention for women

- struggling with their weight (Kg-Free): A randomized controlled trial. *Appetite*, *112*, 107–116.
- Pavot, W., Diener, E. D., Colvin, C. R., & Sandvik, E. (1991). Further validation of the Satisfaction with Life Scale: Evidence for the cross-method convergence of well-being measures. *Journal of Personality Assessment*, *57*(1), 149-161.
- Pavot, W., & Diener, E. (1993). The affective and cognitive context of self-reported measures of subjective well-being. *Social Indicators Research*, *28*(1), 1-20.
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy*, *18*(3), 250-255.
- Rodgers, R. F., Donovan, E., Cousineau, T., Yates, K., McGowan, K., Cook, E., ... Franko, D. L. (2018). BodiMojo: Efficacy of a mobile-based intervention in improving body image and self-compassion among adolescents. *Journal of Youth and Adolescence*, *47*(7), 1363–1372.
- Rosen, J. C., Jones, A., Ramirez, E., & Waxman, S. (1996). Body Shape Questionnaire: Studies of validity and reliability. *International Journal of Eating Disorders*, *20*(3), 315-319.
- Seekis, V., Bradley, G. L., & Duffy, A. (2017). The effectiveness of self-compassion and self-esteem writing tasks in reducing body image concerns. *Body Image*, *23*, 206–213.
- Seligman, M. E. (2011). *Flourish: A visionary new understanding of happiness and well-being*. Simon and Schuster.

- Smeets, E., Neff, K., Alberts, H., & Peters, M. (2014). Meeting suffering with kindness: Effects of a brief self-compassion intervention for female college students. *Journal of Clinical Psychology, 70*(9), 794–807.
- Stern, N. G., & Engeln, R. (2018). Self-compassionate writing exercises increase college women's body satisfaction. *Psychology of Women Quarterly, 42*(3), 326–341.
- Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the positive and negative affect schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*(2), 227-242.
- Yarnell, L. M., Stafford, R. E., Neff, K. D., Reilly, E. D., Knox, M. C., & Mullarkey, M. (2015). Meta-Analysis of Gender Differences in Self-Compassion. *Self and Identity, 14*(5), 499–520.
- Zessin, U., Dickhäuser, O., & Garbade, S. (2015). The relationship between self-compassion and well-being: A meta-analysis. *Applied Psychology: Health and Well-Being, 7*(3), 340–364.
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