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Meditating Your Way to a Healthy Body Image: A Comparison of Loving Kindness Meditation and Mindful breathing

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Bachelor of Arts

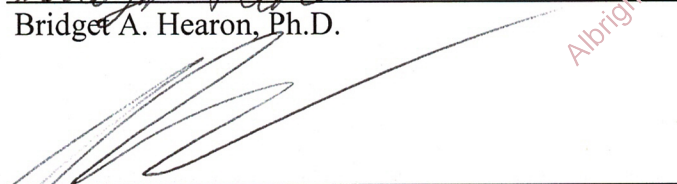
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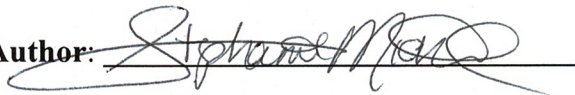
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Abstract

The use of meditation practices has become increasingly common in the treatment of mental disorders. More recently, investigators have started to explore, Loving Kindness Meditation (LKM), which creates feelings of social connection and compassion for the self and others (Salzberg & Goldstein, 2001). The current investigation examined how LKM may buffer against body image dissatisfaction when women are exposed to body image stressors. A total of 90 female participants ($M = 22.38$, $SD = 6.35$, range 17-52 years) were randomized to a 10-minute practice of Mindful Breathing (MB), LKM, or a non-meditation condition. After, participants completed a body image stressor task of rating media images of women. Self-reported mood and body image ratings as well as heart rate were collected throughout the experimental procedures. Results demonstrated there was a significant interaction between heart rate over time and participant condition. For participants in the LKM condition, LKM prompted a significant reduction in heart rate that persisted through the body image stressor task ($F(4, 166) = 2.90$, $p = .024$). Also, when covarying for both initial body image state and drive for thinness, participant condition had a significant effect on body image satisfaction, ($F(2, 84) = 3.21$, $p = .045$, $\eta^2 = 0.07$). Participants in the LKM condition experienced a significantly greater increase in body satisfaction after all the experimental procedures than those in the two other conditions. Taken together, our results suggest that LKM may represent a new treatment to help combat body image dissatisfaction in women.

Keywords: Loving Kindness Meditation, Mindful Breathing, Body Image Dissatisfaction

Meditating Your Way to a Healthy Body Image:

A Comparison of Loving Kindness Meditation and Mindful Breathing

Body dissatisfaction represents a particularly important target of study as estimates indicate that almost half of American women report global, negative evaluations of their bodies (Cash & Henry, 1995; Thompson & Heinburg, 1999), and this construct has been directly linked to the development of eating disorders (Thompson & Heinburg, 1999). More recently, studies have been looking at body dissatisfaction in all representative sections of sex and gender, as well as ways to combat body dissatisfaction since it has become more prevalent. It is particularly prevalent among women. Eating disorders affect 10-13% of women, 57% of adults and 80% of youth do not get treatment for their eating disorder. Continual remission last for only 50% or less of those who were able to get treatment (Stice, Yokum, & Waters, 2015). Jackson et al. (2014) studied body dissatisfaction and depressive symptoms in women ages 42-52 years old. Using the Stunkard Figure Rating Scale and the Center for Epidemiologic Studies Depression Scale, they found that women who are both middle-aged and have body image dissatisfaction are more prone to having depressive symptoms at the clinical level. In addition, it has been found that body image dissatisfaction can influence depressive symptoms in adolescent children (Brausch & Gutierrez, 2009).

Additionally, research has demonstrated that body image dissatisfaction is strongly prevalent among young women. One study displayed that among undergraduate women, there is a large number of body checking behaviors occurring in a single day. Body checking behavior predicted body image dissatisfaction and more negative affect (Stefano, Hudson, Whisenhunt, Buchanan, & Latner, 2016). Body image satisfaction and self-esteem are important for psychological health of women according to Koyuncu, Tok, Canpolat and Catikkas (2010). They studied self-esteem, body fat ratio, body image satisfaction, body image dissatisfaction, and

social physique anxiety in women who exercise and those who do not. Participants were women ages 18-60 years old, and they found that body image satisfaction and self-esteem were highly linked to females who were athletic because they are likely be more critical of their physical attributes. These results suggest that exercise influences and moderates self-esteem, body image satisfaction, and social physique anxiety since the athletic population had the highest ratings in these categories.

More recently, media and technology have played a major role in body image dissatisfaction. Women are bombarded daily with images that distort their view of themselves and their self-esteem through different mediums such as billboards, television, social media, and more. In a review of media's influence on body image and eating disorders, it was found that individuals who internalize what society depicts as the norm in relation to desirability are affected the most with body image disturbance (Thompson & Heinburg, 1999). Exposure to the Internet and social media can also influence body image dissatisfaction. In a study of Internet use and body dissatisfaction among Canadian women ages 12 to 29 years old, it was found that women who spent 20 hours or more per week using the Internet had significantly more body image dissatisfaction than women who spent less time using the Internet (Carter, Forrest, & Kaida, 2017). Bair, Kelly, Serdar, and Mazzeo (2012) studied image-focused media and body image dissatisfaction in young women, particularly undergraduate college students. They found that image-focused internet use was significantly associated not only with body image dissatisfaction, but also eating pathology and thin-ideal internalization.

In an effort to research what could help decrease body dissatisfaction, Barnett and Sharp (2016) studied how self-compassion may mediate body image dissatisfaction. They conducted two studies, one centering on maladaptive perfectionism, body image satisfaction, and self-

compassion; and the other centering on maladaptive perfectionism, body image satisfaction, self-compassion, and disordered eating. The participants were female undergraduate students' ages 18-30 years old. The participants answered an online survey of measures including the Body Image State Scale (BISS) and The Self-Compassion Scale. Overall, they found that self-compassion meditated body image dissatisfaction and maladaptive perfectionism but did not mediate maladaptive perfectionism and disordered eating. With the prevalence of body dissatisfaction and results from the study by Barnett and Sharp (2016), venturing into the area of meditation and self-compassion could be helpful in aiding body dissatisfaction.

In addition, Stice, Yokum, and Waters (2015) conducted a study to examine if a dissonance-based intervention, *The Body Project*, would reduce body dissatisfaction in female adolescents with self-reported body image distress. *The Body Project* had participants promote an attitude toward body image that was inconsistent with their ideals, thus having created cognitive dissonance and changed their original outlook on their body image. They found that *The Body Project*, an unconventional, counter-attitudinal treatment program, helped reduce eating disorder risk factors like body image dissatisfaction and thin ideal when looking at media images through reviewing fMRI results that showed how the participants had decreases in caudate and putamen feedback.

The use of mindfulness and meditation practices has become increasingly common in the treatment of mental disorders. In fact, three of the leading, empirically-supported treatments for mood, anxiety, and personality disorders, Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), and Dialectical Behavioral Therapy (DBT) now incorporate meditation practices in their manuals (Linehan, 1993; Sipe & Eisendrath, 2012; Zettle, 2010). However, despite the clinical utility of meditation practices in relieving symptoms, research has

only begun to explore whether the type of meditation practice used for symptomatology is important.

Research studies that include meditational practices have largely focused on the study of guided, mindful breathing (MB) exercises geared toward helping patients ground themselves in the present without judging their specific experience (i.e., thoughts and sensations that arise; Segal, Williams, & Teasdale, 2002). For instance, Burg, Wolf, and Michalak (2012) studied mindful breathing, attention, and heart rate variability. Heart rate variability is associated with wellness and can be used as a physiological indicator of mindfulness. They had participants complete a mindful breathing exercise on a computer and used a Polar® Heart Rate Monitor to record heart rate variability. Results indicated that participants with better self-regulation in terms of attention had indications of higher heart rate variability.

More recently, investigators have begun to explore an alternative practice, Loving Kindness Meditation (LKM) or *metta* (Kearney et al., 2013). Whereas MB attempts to instill awareness of the present moment, LKM asks practitioners to create feelings of social connection and compassion for the self and others (Salzberg & Goldstein, 2001). LKM derives from the pali language word *metta*. *Metta* translated means loving-kindness (Kearney et al., 2013). There has been evidence to suggest that the practice of LKM used as a stand-alone intervention or as an adjunct to other interventions can reduce symptoms and distress across a range of psychological difficulties. For instance, Johnson et al. (2011) looked at schizophrenia and LKM. Studies have shown that individuals with negative schizophrenia symptoms experience decreased anticipatory pleasure, which provides an explanation for the symptom anhedonia. They applied LKM to people with schizophrenia to attempt to apply the Build and Broaden Theory. With the Build and Broaden Theory, it was hypothesized that LKM can manifest and expand positive emotions

within the participants thus reducing the negative schizophrenia symptoms. After analysis, their participants reported feeling less negative emotions and more intense positive emotions. Specifically, participants reported feeling more control in their lives and more accepting of who they are.

Further, LKM has been applied to post-traumatic stress disorder (PTSD) and depression. Kearney et al. (2013) describe PTSD and depression with characteristics of rumination, criticism of oneself and suppression of thoughts. Literature has displayed that developing self-compassion could be beneficial for those who suffer from PTSD. Self-soothing techniques like compassionate mind training have been noted to reduce depression, self-criticism and more. Kearney et al. (2013) describe LKM as way to craft a sense of compassion and kindness for oneself and others. Here, they applied LKM as an adjunct to prolonged exposure or cognitive processing therapy in veterans who suffer from PTSD. The participants attended an LKM course for twelve weeks. Participants gave reports both immediately after the LKM treatment and at six-month follow-up. They found that participants had significantly higher rates of self-compassion in the follow-up report compared to the baseline report. Reductions in PTSD and depression symptoms were also found after three months of the LKM treatment.

Feliu-Soler et al. (2016) applied LKM to Borderline Personality Disorder (BPD). Individuals with BPD can experience impulsiveness, mood swings, trouble with interpersonal relationships, and distortions with their identity. Here, they applied LKM to BPD populations to help develop their self-compassion. Their participants had moderate to high BPD, were receiving treatment for BPD, and had a background in mindfulness during past DBT treatment (Linehan, 1993). The participants did either LKM or Mindfulness Continuation Training for three weeks. They found significant changes in pre and posttest analysis of the reports provided by the

participants in the LKM condition across five different measures: acceptance, mindfulness, self-criticism, self-kindness, and the severity of BPD.

Additionally, LKM has also proven successful as an intervention for physical ailments including decreasing pain and emotional tension in individuals with migraines as well as chronic pain (Carson et al., 2005; Tonelli & Wachholtz, 2014). Carson et al. (2005) studied lower back pain and LKM. They wanted to see if LKM can reduce anger and pain in individuals who suffer from lower back pain as LKM can help their affect develop more positive emotions. The participants were middle age adults who had chronic lower back pain. The participants completed eight weeks of LKM. Results showed that participants experienced a significant reduction in lower back pain. Participants who practiced longer had even more benefits from the LKM practice. Also, Tonelli and Wachholtz (2014) studied LKM and migraines. They wanted to use LKM to moderate emotional tension and pain from migraines. The participants practiced LKM for 20 minutes. Significant reports of decrease in emotional tension were found as well. LKM has also been shown to decrease negative reactions to repetitive thoughts (Feldman, Greeson, & Senville, 2010). Feldman, Greeson, and Senville (2010) studied the effects MB, LKM, and Progressive Muscle Relaxation (PMR) on decentering and negative reactions to negative thoughts. They found that LKM and PMR were shown to be superior to MB in reducing negative reactions to repetitive thoughts.

Despite the broad applications of LKM in the literature to date, no studies have examined its effect with regard to body dissatisfaction in women. Therefore, the purpose of the current study was to examine a single-session practice of LKM in the context of a priming task meant to activate body dissatisfaction. In addition, we examined whether the specific compassion-promoting focus of LKM is superior to the more general meditative practice of MB. We

hypothesized that participants randomized to the LKM condition would experience less increases in body image dissatisfaction during a stressor task than participants in the MB and control conditions. We also hypothesized that participants in the LKM condition would show greater physiological response during the assigned condition and subsequent stressor task than those in the other two conditions. We also hypothesized that participants in the LKM condition would show greater positive affect and less negative affect after the body image stressor task.

Method

Participants

There were a total of 90 participants in this study. Qualifications were that the participant must be female and over the age of sixteen. The mean age of the participants was 22.38 ($SD = 6.35$, range 17-52 years), (see Table 1). The participants were recruited from the community via word of mouth, email, social media, and flyers. Undergraduate student participants were solicited from the Psychology Department of Albright College via word of mouth, email, social media and in-class visits at the professor's discretion. Participants who participated during the ten-week Albright Creative Research Experience (ACRE) grant period over the summer months of 2016 were paid \$10 as compensation for participation. Participants who participated after the ACRE grant period were compensated with extra credit in their psychology courses. Participation in the study was completely voluntary. The Albright College Institutional Review Board approved all study procedures.

Materials and Procedure

Participants attended an in-person appointment that ranged from forty to sixty minutes. Mild deception was employed as they were told they were participating in a study about the impact of meditation practices on perceptions of attractiveness of others. First, participants were

given an informed consent form to read, sign, and date. In the case of participants under age 18, parental consent and participant assent were obtained. They were then given privacy to put on a Polar® heart rate monitor, after which a two-minute baseline reading was conducted as a measure of resting heart rate. Then, participants were given a packet of self-report questionnaires described below designed to assess mood, as well as state and trait body image, and eating behaviors/attitudes toward food.

Next, participants were randomized to one of three conditions: 1) 10-minute guided LKM practice, 2) 10-minute guided MB practice, or 3) 10-minute neutral task (watching an instructional YouTube video about making sand castles). The guided meditations were presented through a recorded script as used in previous research. Heart rate was recorded during the condition using a Polar® heart rate monitor. Following the condition, participants went through a task meant to activate feelings of body dissatisfaction. Participants viewed 50 images of women and were asked to rate the attractiveness and physical fitness of each. The images were rated on a seven point Likert scale. The media images portrayed stereotypical standards of body attractiveness in the United States. The survey was created using the software program, *Media Lab*. Using the *Media Lab* program, participants viewed each image for 10 seconds before rating the image. The media images were sourced from popular media (i.e., mainstream websites and popular fashion websites). Heart rate was also recorded during the online survey.

Finally, participants again completed the Body Image State Scale (BISS) and Positive and Negative Affectivity Scale (PANAS) questionnaires. Then, participants' height and weight were recorded to calculate Body Mass Index (BMI). After, participants were given privacy to remove the Polar® heart rate monitor. They were then debriefed and given compensation.

Measures

Polar® Heart Rate Monitor

A Polar® Heart Rate Monitor FT4 measures continuous heart rate. It includes a watch for tracking and an adaptable fabric material chest strap for recording.

Depression Anxiety and Stress Scale (DASS)

DASS-21 is a 21- question measure meant to assess symptoms of anxiety and depression (Lovibond & Lovibond, 1995).

Body Image State Scale (BISS)

BISS is a six question measure developed to assess personal state of mind and evaluation of one's body image (Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002).

Objectified Body Consciousness Scale (OBCS)

OBCS is a 24- question measure developed to measure body shame, body surveillance and belief of appearance (McKinley & Hyde, 1996)

Positive and Negative Affectivity Scale (PANAS)

PANAS is a 20- question measure used to assess positive and negative affectivity at present moment (Watson, Clark, & Tellegen, 1988).

Eating Disorders Inventory (EDI)

EDI is a 64- question measure developed to assess symptoms common of bulimia and anorexia nervosa. The EDI is a multiscale measure consisting of eight subscales that measure: Drive for

Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Perfectionism, Interpersonal Distrust, Interoceptive Awareness, and Maturity Features (Garner, Olmstead, & Polivy, 1983).

Stunkard Body Image States Scale

The Stunkard Body Image States Scale is used to measure how individuals perceive how they believe they look in terms of body size and how they believe they should ideally look. There are two questions, perception of current body image and ideal body image. The body figure images range from bodies simulating underweight body mass index to obese body mass index (Stunkard, Sorensen, & Schlusinger, 1983).

Interventions

Loving Kindness Mediation

Those randomized to this condition followed procedures set forth by Salzberg and Goldstein (2001). The purpose of the exercise was to foster feelings of social connection and compassion for oneself and others. First, participants were guided to mentally repeat the phrases, “May I live in safety. May I be happy. May I be healthy. May I live with ease.” Participants were then asked to visualize a good friend and mentally direct a similar wish for wellness to them using the phrases above, “May XXXX (identified close friend) be happy.....” The script then progressed to other individuals included, “someone you know who is having a difficult time,” “a person in your life who you do not know very well,” and “a person who is mildly difficult or irritating.” After all of these individuals, the participant was asked to send similar wishes to “all beings everywhere.” This cycle (wishes for self, designated others, world) was repeated until the 10-minute time period concludes.

Mindful Breathing

Those randomized to the mindful breathing condition followed procedures set forth by Segal, Williams, and Teasdale (2002). Participants were guided to become aware of physical sensations- particularly those related to breathing- and to observe them without the intention of altering them. They were asked to notice in an accepting, non-judgmental manner when their minds wander to something other than the exercise and to gently return focus to the sensations of breathing. The primary focus of this exercise was on the direct perception of breathing rather than specific thoughts that arise. Participants continued with this practice for 10 minutes.

Neutral Condition: Those randomized to this condition watched a 10-minute instructional video designed to teach individuals how to make a sand castle. This video guided participants through the necessary steps of construction from beginning to end. Similar instructional videos have been used as neutral stimuli in other research. This condition was meant to provide a time-matched activity that would not be expected to evoke any strong emotions or influence feelings of body dissatisfaction.

Data analysis

To analyze the data, a Two-Way ANOVA, Mixed Model was used to analyze heart rate over time and participant condition to capture which meditational practice helped the participant best throughout the study procedures, in particular, the body image stressor task. A One-Way ANOVA, Independent Measures was used to analyze body image state scores (BISS) after the study measures were completed. Body image state score (BISS) taken during the study procedures was used as a covariate. One-Way ANOVA, Independent Measures were used to measure both positive and negative affectivity (PANAS) after the study measures were completed. Positive and

negative affectivity (PANAS) taken during the study procedures was used as a covariate. The EDI Drive for Thinness scale was also used as a covariate in all analyses given previous literature indicating greater body image dissatisfaction among women who endorse this ideal (Bair et al., 2012).

Results

A 3(time points) X 3(participant condition) ANOVA, mixed model was used to see the effects of participant condition on heart rate over time in the participants. The time points were baseline (time 1), during the condition (time 2), and during the body image stressor task (time 3). There was a main effect for the heart rate changes over time, ($F(2, 166) = 8.36, p < .001, \eta^2 = 0.91$). Time 3 ($M = 77.13, SE = 1.23$) had a significantly lower heart rate than time 1 ($M = 79.16, SE = 1.33$). Time 2 ($M = 77.25, SE = 1.26$) had a significantly lower heart rate than time 1 ($M = 79.16, SE = 1.33$). Time 3 ($M = 77.13, SE = 1.23$) had a significantly lower heart rate than time 2 ($M = 77.25, SE = 1.26$). There was no main effect for condition, ($F(2, 83) = .557, p = .575$). However, there was a significant interaction between heart rate over time and condition, ($F(4, 166) = 2.90, p = .024, \eta^2 = 0.07$). Figure 1 illustrates the interaction between time and participant condition.

Body Image State Scale (BISS) scores were totaled and used as a measure of immediate body image satisfaction during the study procedures. A One-Way ANOVA, independent measures, showed that participant condition had a trend level effect on body image satisfaction, ($F(2, 86) = 2.63, p = .078, \eta^2 = 0.06$). Figure 2 illustrates the trend level effect between participant condition and body image satisfaction. When used as a covariate, body image state scores during study procedures had a significant effect on the subsequent body image state scores, ($F(1, 86) = 120.22, p < .001, \eta^2 = 0.58$).

Positive and Negative Affectivity Scales (PANAS) scores were totaled and used to measure immediate positive and negative affect during the study procedures. A One-Way ANOVA, independent measures, displayed that participant condition did not have a significant effect on negative affect in the participants, ($F(2, 86) = .288, p = .751$). When used as a covariate, negative affectivity scores during the study procedures had a significant effect on subsequent negative affectivity scores, ($F(1, 86) = 29.28, p < .001, \eta^2 = 0.25$). Further, a One-Way ANOVA, independent measures, showed that participant condition did not have a significant effect on positive affect in the participants, ($F(2, 86) = .828, p = .440$). However, when used as a covariate, positive affectivity scores during the study procedures had a significant effect on subsequent positive affectivity scores, ($F(1, 86) = 110.00, p < .001, \eta^2 = 0.56$). These significant effects for positive and negative affect show affect before the study measures accurately predicted affect after the study procedures.

Given the importance of endorsing a thin ideal for reactivity to the body image stressor task, analyses were repeated including the EDI-Drive for Thinness subscale as a covariate. With regard to changes in heart rate, there was no main effect for EDI Drive for Thinness ($F(1, 81) = .427, p = .515$). However, results remained consistent where there was a significant interaction between heart rate over time and condition with the EDI Drive for Thinness as a covariate, ($F(4,162) = 2.52, p = .044, \eta^2 = 0.06$).

When considering body image while controlling for EDI-Drive for Thinness, results again revealed baseline BISS scores as a significant predictor of BISS scores following the stressor task ($F(1, 84) = 75.89, p < .001, \eta^2 = 0.48$). Results also demonstrated that EDI Drive for Thinness had a significant effect on body image state scores taken after all the measures were completed, ($F(1, 84) = 4.75, p = .032, \eta^2 = 0.05$). Contrasting prior results, when covarying for

both initial body image state scores and EDI Drive for Thinness, participant condition had a significant effect on body image satisfaction, ($F(2, 84) = 3.21, p = .045, \eta^2 = 0.07$). Figure 2 demonstrates the significant effect of participant condition on body image satisfaction.

Addition of the EDI-Drive for Thinness scale as a covariate had no effect on analyses examining changes in affect. Condition did not emerge as a significant predictor of either positive or negative affect following the body image stressor task.

Discussion

Mindful Breathing has positively impacted the treatment of psychological disorders (Linehan, 1993; Sipe & Eisendrath, 2012; Zettle, 2010), however, the present study sought to determine whether a single-session practice of Loving Kindness Meditation buffered against body-image dissatisfaction more successfully than this standard treatment and a neutral comparison condition. Consistent with our hypothesis, we found a significant interaction between heart rate over time and participant condition with and without the EDI Drive for Thinness covariate. There was a medium-sized effect. All participants' baseline beats per minute (bpm) began the study averaging about the same but participants randomized to the LKM condition has a significant decrease in bpm during the meditational practice period, and this persisted through the body image stressor task. The participants randomized to the MB or control task conditions did not have a similar pattern in bpm. This demonstrates that physiologically participants in the LKM condition showed more resistance to body image dissatisfaction as they were more relaxed both after the meditational condition and after the body image stressor task.

These results are consistent with the findings of Barnett and Sharp (2016) where they found that self-compassion can mediate body image dissatisfaction and Feldman, Greeson, and

Senville (2010) where LKM was found to be superior to MB in the treatment of negative reactions to repetitive thoughts. Females who suffer from body image dissatisfaction have repetitive thoughts of ill feelings toward oneself and other women. The results from the current investigation, coupled with the results found by Feldman, Greeson, and Senville (2010) indicate that LKM is a form of treatment worth further applying to body image dissatisfaction. Burg, Wolf and Michalak (2012) found that heart rate variability, likely shown in the current study, indicated better self-regulation and attention. Participants randomized to the LKM condition in the current study displayed the most significant heart rate variability. This finding demonstrated that the participants had a strong amount of focus on the LKM practice and attention on dissuading the effects of body dissatisfaction.

Supporting our hypothesis, we also found that when analyzing the influence of participant condition on body image satisfaction scores (BISS) (post body image stressor task), initially there was a trend level effect, but once the EDI Drive for Thinness variable was added as an additional covariate to the pre-condition and body stressor task BISS scores, the trend level effect became significant with a medium-sized effect. The EDI Drive for Thinness subscale measures how much the participant engages in behaviors that show that they have a thin ideal. Participants in the LKM condition experienced significantly higher body image satisfaction after the body stressor task than the participants in the other two conditions. Similarly, Stice, Yokum and Waters (2015) found that reductions in thin-ideal internalization and body dissatisfaction during exposure to a body image stressor (i.e. media images) were imperative to decreasing the development of eating disorders.

Contrasting our hypothesis, we found that there was no significant influence of participant condition on positive or negative affect post body image stressor task. These results

were found with the pre-procedures PANAS level and with the added EDI Drive for Thinness covariates. It is possible that participants could have been suffering from fatigue effects as the PANAS was the last self-report measure completed or that LKM exerts its effects more specifically on body satisfaction rather than state affect more broadly.

There were several limitations that may have affected the results of the study. The study was meant to represent a sample population of women in the nation, but the mean age of the female participants in this study was only 22.38 years. A more representative mean would have allowed for the results to be more generalized to female population. The use of subjective measures for analysis in the study could have also affected the results. We applied mild deception as the participants were told that they were ratings media images of women, but the subjective measures instructed the participants to rate themselves before doing the body image stressor task. With that, the participants may have known that the study was more so focused on the individual rather than the other individuals, thus influencing our study focus and results. However, the inclusion of two active forms of meditation helps mitigate the potential demand effects of this particular limitation. Fatigue effects may have also negatively affected the data. Participants completed hour-long appointments with self-report questionnaires and a fifty-item body stressor task. Due to the length of the study and procedure, the final self-report questionnaire answers could have been influenced by fatigue effects.

For future directions, we would like to replicate the study and run male participants. Examining how to combat body image dissatisfaction in males is highly important due to the increasingly pervasive number of males with body image dissatisfaction in the U.S. (Galioto & Crowther, 2013). We would also like to repeat the study and look at dose response. For instance, since it is now established that LKM can positively impact and immediately decrease body

image dissatisfaction with one ten minute session of LKM, we need to research how much LKM is needed to make more of an impact and decrease body image dissatisfaction more long term.

Lastly, we would also like to conduct dissemination studies and review how to get the information about the positive influences of LKM on body image dissatisfaction to the public so it can be used in the general population.

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Variable	N	Mean(SD)/%
Age	89	22.38 (6.35)
Sex(% female)	90	100%
Ethnicity(% non-Hispanic)	88	80%
Race	90	
% Caucasian		63.30%
% African- American		31.10%
% Asian		8.90%
% American Indian/ Alaska Native		1.10%
% Native Hawaiian/ Pacific Islander		2.20%
% Other		1.10%
Employment	90	
Yes		82.20%
No		17.80%
Education Level	90	
Did not graduate high school		2.20%
High School Diploma/ GED		10%
Some College		67.80%
College		14.40%
Graduate School		5.60%
BMI	89	27.24 (5.96)

Table 1.

Demographic Information for the sample.

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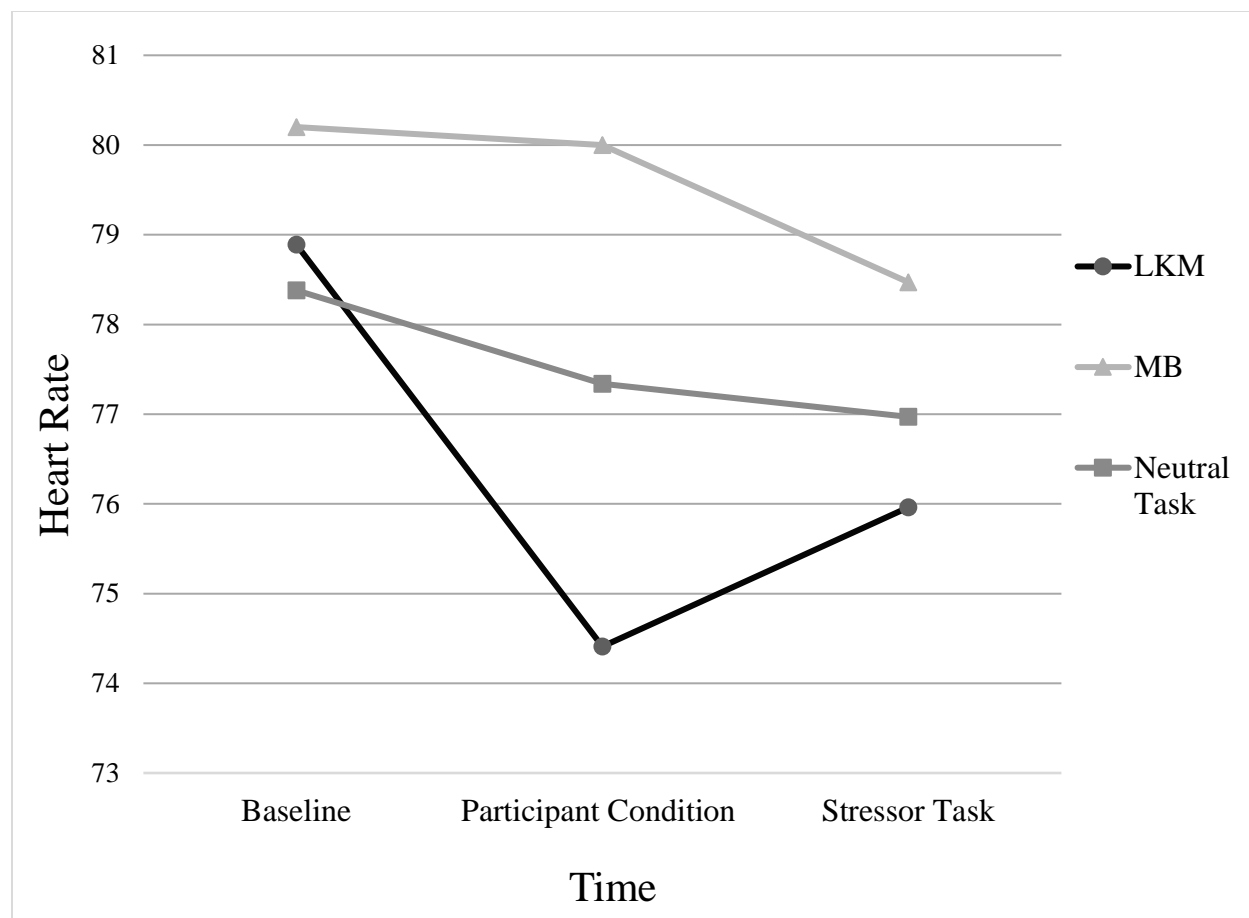


Figure 1. Mean differences in heart rate over time per participant condition.

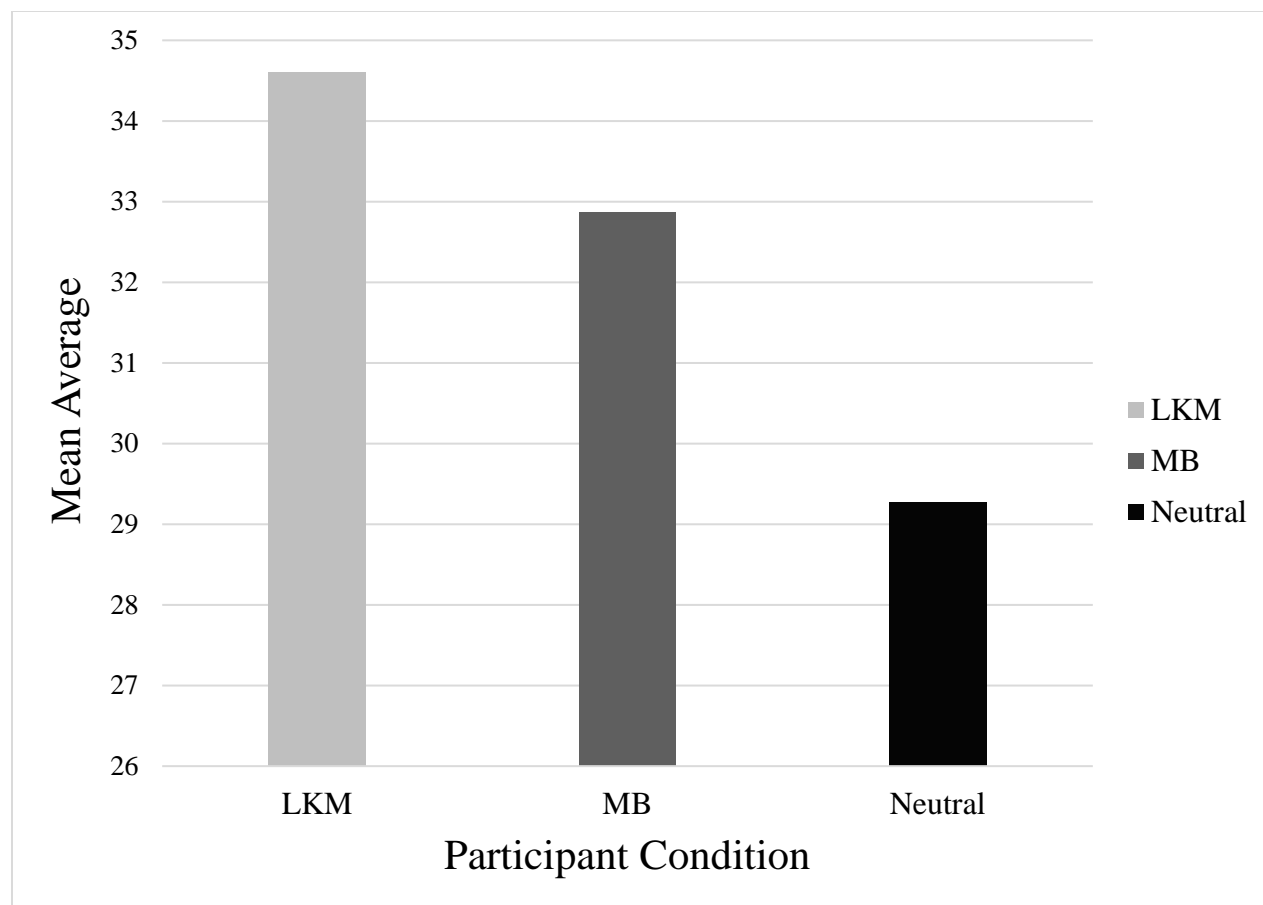


Figure 2. Mean differences in body image state (BISS) outcomes per participant condition.