Empirical Research

Exploring the addition of self-compassion skills training to a behavioral weight loss program delivered using video conferencing software

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ABSTRACT

The primary aim of this investigation was to examine the efficacy, feasibility, and acceptability of adding SC skills training to a standard behavioral weight loss program (BWLP + SC), with the secondary aim of replicating prior research utilizing video conferencing technology to deliver a small group, weekly BWLP. The sample originally consisted of 54 individuals. The BWLP utilized Webex video conferencing software to deliver a 12-week interactive BWLP. Participants were randomized to a standard BWLP or a standard BWLP augmented with self-compassion skills training (BWLP + SC). Over the course of treatment, participants lost on average 7.2 lbs or 3.3% of their body weight. Other gains included a significant reduction in total calories, increased physical activity, and a reduction in maladaptive eating patterns. Among all participants, significant associations were observed between higher baseline SC, lower maladaptive eating, and higher intuitive eating. Among participants in the self-compassion group, a significant increase in self-compassion was observed, but treatment outcomes were not improved among these participants relative to the BWLP participants. The promising results from the current investigation suggest that the utilization of video conferencing software and the addition of SC skills training to the treatment of obesity has merit. Continued investigation of both SC skills training and virtual technology platforms in the delivery of weight loss research is recommended.

1. Introduction

In the United States, approximately 42.4% of adults are obese (Hales, Carroll, Fryar, & Ogden, 2020), contributing between $147 and $210 billion in annual healthcare costs (Finkelstein, Trogdon, Cohen, & Dietz, 2009). Obesity is associated with diminished health and psychological well-being, thus there is a significant need for cost-effective, wide-reaching, and successful treatments. A relatively new but growing area within the weight management literature is that of acceptance-based therapeutic approaches (e.g., Palmeira, Pinto-Gouveia, & Cunha, 2017; Rahimi-Ardabili et al., 2018). Among these is self-compassion (SC), defined as relating to oneself and one’s emotional challenges with a sense of kindness, mindfulness, and common humanity, a practice which has garnered preliminary support (Neff, 2003; Rahimi-Ardabili et al., 2018).

Practicing self-compassion is intended to reduce self-judgement, unproductive rumination, or feeling isolated in response to perceived failures or challenges (Neff, 2003). While the benefits of self-compassion for general mental health and well-being outcomes have been widely supported, applications of self-compassion-based approaches for obesity and associated outcomes have been examined more recently. A systematic review of six studies demonstrated the benefits of self-compassion-based interventions to improve non-assisted weight loss attempts, nutrition and eating behaviors, and body image (Rahimi-Ardabili et al., 2018). Few interventions have included self-compassion as the primary component (Adams & Leary, 2007; Albertsson, Neff, & Dill-Shackleford, 2015), while others have integrated it into more extensive, multi-component interventions (Griffiths, Williamson, Zucchelli, Paraskeva, & Moss, 2018; Palmeira, Cunha, & Pinto-Gouveia, 2019; Palmeira et al., 2017). In a lab-based manipulation study, Adams and Leary (2007) found that following a brief self-compassion induction, restrictive eaters engaged in less disinhibited eating, self-criticism, and had less negative affect following an unhealthy food preload, a common cycle among restrictive, guilty eaters (Adams & Leary, 2007). Additionally, in a randomized controlled trial of a 12-session, ACT-based intervention for women with overweight and obesity (KG Free), self-compassion was incorporated in sessions 8–10 (Palmeira et al., 2017). Participants experienced significant

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improvements to BMI, health-related QOL, physical exercise, eating behaviors, weight self-stigma, self-criticism, and relevant psychological factors (i.e., weight-related experiential avoidance, psychological symptoms) compared to a treatment as usual comparison group. Regarding processes of change, self-compassion was a partial mediator in weight and eating-related outcomes (Palmeira et al., 2019). Lastly, a three-week self-compassion intervention for women, which consisted of listening to daily assigned self-compassion meditations, resulted in significant reductions in body shame, body dissatisfaction, and increases in body appreciation relative to a waitlist control group (Alberthson et al., 2015).

Findings from this early intervention research are consistent with cross-sectional research on self-compassion and self-reported eating behaviors, body image, and additional factors related to obesity and weight management. For example, a systematic review demonstrated that SC may protect against disordered eating pathology and body image disturbances for individuals across the weight continuum (Braun, Park, & Gorin, 2016). Disordered eating pathology and body image disturbances have been shown to be counterproductive to weight loss efforts and predict poorer outcomes in treatment-seeking individuals with obesity (Austin, Serier, Sarafin, & Smith, 2017; Carels et al., 2009; Dochot, Godfrey, Golshan, Cuneo, & Afari, 2019; Teixeira et al., 2015). It may be that body dissatisfaction and eating pathology (e.g., patterns of rigid, extreme restriction and later disinhibition) undermine adherence to lifestyle changes that promote and maintain weight loss, such as adaptive eating patterns and consistent physical activity (Austin et al., 2017; Teixeira et al., 2015). Ultimately, cross-sectional and early intervention research in this domain suggests that adding SC training to a standard behavioral weight loss program (BWLP) may improve functioning across multiple psychological aspects of obesity and aid weight loss.

In response to the COVID-19 pandemic and the attendant risk of disease spread through face-to-face contact, interest in telehealth interventions has increased dramatically (Wosik et al., 2020). These technologies hold promise of making interventions more accessible to hard-to-reach populations and is an efficient and cost-effective means for delivering and accessing quality health care services and outcomes (Gajarawala & Pelkowski, 2021). Telehealth has the potential to improve care for patients in rural areas or areas with provider shortages. Telehealth further improves access to resources, improves efficiency without higher costs, reduces patient travel times and expenses, and allows for comparable or improved quality of care (Gajarawala & Pelkowski, 2021). A review of 84 studies found that interventions with extra components or technologies resulted in significantly more weight loss than those interventions without technology (Hutchesson et al., 2015).

Of note, despite advances in eHealth and telemedicine, recent meta-analyses on weight-related outcomes (Bian et al., 2017; Huang, Lin, & Wu, 2019; Joiner, Nam, & Whittemore, 2017) suggest the utilization of synchronous video conferencing software is still fairly uncommon and real-time communication is often limited to anonymous, online chat rooms, etc. (Harvey-Berino et al., 2010; Webber, Tette, & Quintiliann, 2008; West et al., 2014). As such, relatively few weight loss studies employ video conferencing technologies which allows participants to interact with the group leader and each other. However, the few studies that do suggest that, online, synchronous deliver of BWLPs can effectively help participants lose weight. Therefore, the primary aim of this intervention was to examine the efficacy, feasibility, and acceptability of adding SC skills training to a standard behavioral weight loss program (BWLP + SC), with the secondary aim of replicating prior research utilizing video conferencing technology to deliver a small group, weekly BWLP. The BWLP utilized a 12-week abridged version of the Diabetes Prevention Program weight loss intervention (Diabetes Prevention Program Research, 2002). The Diabetes Prevention Program weight loss intervention was selected because it is a highly successful lifestyle intervention with considerable empirical support for its effectiveness in a variety of modalities and patient populations, including eHealth (Bian et al., 2017; Goveia et al., 2018; Joiner et al., 2017; Ma et al., 2013). Consistent with prior research, it was hypothesized that participants in the BWLP + SC would reduce maladaptive eating behaviors, increase in self-compassion, and lose significantly more weight than their BWLP counterparts.

2. Methods

2.1. Participants

Participants were 54 individuals with a mean baseline body mass index (BMI) of 35.7 (SD = 5.6). See Table 1 for demographic information. Participants were recruited using an e-mail listserv announcement to individuals at a large southeastern university in the United States and the surrounding geographic community. Inclusion and exclusion criteria required that participants be 18 or older, have English language literacy and fluency, a BMI of 27 kg/m2 or greater, and availability to attend weekly online groups. Participants were required to have reliable internet connection and a computer or mobile smartphone. It was also requested that participants have their cameras on to mimic the group setting as closely as possible. Recruitment began in June 2020 and ended in August 2020. Initial weight assessments were conducted from August 10th, 2020–August 19th, 2020. The 12-week intervention was given from August 24th, 2020 to November 9th, 2020. Final weight assessments were conducted from November 12th, 2020 to November 19th, 2020.

2.2. Study design

The 12-week intervention was delivered via Cisco Webex video conference software in a small group format. The intervention was administered via videoconferencing due to the COVID-19 pandemic.

Table 1: Participant demographics.

<table>
<thead>
<tr>
<th>Age M (SD)</th>
<th>Self-Compassion</th>
<th>Standard Weight Loss</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.00 (12.56)</td>
<td>52.39 (12.13)</td>
<td>52.19 (12.21)</td>
<td></td>
</tr>
<tr>
<td>Height, Inches M (SD)</td>
<td>66.15 (3.47)</td>
<td>65.64 (2.63)</td>
<td>65.89 (3.04)</td>
</tr>
<tr>
<td>Weight, Pounds M (SD)</td>
<td>221.88 (49.78)</td>
<td>221.50 (43.15)</td>
<td>221.69 (46.01)</td>
</tr>
<tr>
<td>BMI M (SD)</td>
<td>35.31 (5.42)</td>
<td>35.99 (5.88)</td>
<td>35.66 (5.62)</td>
</tr>
<tr>
<td>Gender n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>20 (76.9%)</td>
<td>24 (85.7%)</td>
<td>44 (81.5%)</td>
</tr>
<tr>
<td>Male</td>
<td>6 (23.1%)</td>
<td>4 (14.3%)</td>
<td>10 (18.5%)</td>
</tr>
<tr>
<td>Race n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>11 (42.3%)</td>
<td>4 (13.6%)</td>
<td>15 (27.8%)</td>
</tr>
<tr>
<td>White</td>
<td>11 (42.3%)</td>
<td>18 (64.3%)</td>
<td>29 (53.7%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (7.7%)</td>
<td>1 (3.6%)</td>
<td>3 (5.6%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latinx</td>
<td>2 (7.7%)</td>
<td>1 (3.6%)</td>
<td>3 (5.6%)</td>
</tr>
<tr>
<td>Sexual Orientation n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straight</td>
<td>24 (100%)</td>
<td>21 (75%)</td>
<td>45 (95.7%)</td>
</tr>
<tr>
<td>Gay</td>
<td>0</td>
<td>1 (3.6%)</td>
<td>1 (1.9%)</td>
</tr>
<tr>
<td>Bisexual</td>
<td>0</td>
<td>1 (3.6%)</td>
<td>1 (1.9%)</td>
</tr>
<tr>
<td>Education n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>7 (26.9%)</td>
<td>3 (10.7%)</td>
<td>10 (18.5%)</td>
</tr>
<tr>
<td>Completed college</td>
<td>8 (30.8%)</td>
<td>3 (10.7%)</td>
<td>11 (20.4%)</td>
</tr>
<tr>
<td>Graduate or Professional Degree</td>
<td>9 (34.6%)</td>
<td>17 (60.7%)</td>
<td>26 (48.1%)</td>
</tr>
<tr>
<td>Income n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$10,000 – 19,999</td>
<td>1 (3.8%)</td>
<td>0</td>
<td>1 (2.2%)</td>
</tr>
<tr>
<td>$20,000 – 39,999</td>
<td>1 (3.8%)</td>
<td>0</td>
<td>1 (2.2%)</td>
</tr>
<tr>
<td>$40,000 – 59,999</td>
<td>9 (34.6%)</td>
<td>2 (7.1%)</td>
<td>11 (24.4%)</td>
</tr>
<tr>
<td>$50,000 – 79,999</td>
<td>2 (7.7%)</td>
<td>6 (21.5%)</td>
<td>8 (17.8%)</td>
</tr>
<tr>
<td>$80,000 – 99,999</td>
<td>3 (11.5%)</td>
<td>2 (7.1%)</td>
<td>5 (11.1%)</td>
</tr>
<tr>
<td>$100,000 – &gt; $150,000</td>
<td>6 (23.1%)</td>
<td>13 (46.4%)</td>
<td>19 (42.2%)</td>
</tr>
</tbody>
</table>

* Group differences, p < .05.
Participants used both computers and mobile phones based on their personal choice. All 54 participants were randomly assigned to a BWLP (N = 28) or a BWLP + SC group (N = 26). Groups were held weekly during which one chapter was discussed resulting in 12 total classes. The BWLP and the BWLP + SC met for 60-min and 90-min sessions, respectively. Nearly all participants began the program with a live orientation. Two participants watched a recording of the orientation due to scheduling conflicts. Baseline and post-treatment questionnaires were conducted in person by graduate trainees in a Clinical Psychology Doctoral program under the supervision of a licensed psychologist utilizing COVID-19 safety protocols. During the initial weight assessment, participants were given the corresponding workbook to the 12-week abridged version of the Diabetes Prevention Program. Participants were not compensated; however, they were provided the BWLP at no cost to them. This study was IRB approved (UMCIRB 20–001508).

2.3. Treatment

Behavioral Weight Loss Program (BWLP). The BWLP utilized a 12-week abridged version of the Diabetes Prevention Program (PP; Diabetes Prevention Program Research, 2002). Chapters emphasized caloric and macronutrient tracking, increased exercise, self-monitoring, general tips for reducing caloric and fat intake and behavior-focused interventions (e.g., learning cues and triggers for overeating). Participants were given a workbook and one chapter was discussed each week during group. Participants were encouraged to monitor their caloric intake using the MyFitnessPal application, a free calorie counter (MyFitnessPal.com or a smartphone application version). Weekly groups were facilitated by graduate trainees in a Clinical Psychology Doctoral program under the supervision of a licensed psychologist. Each group had between 5 and 15 participants. See Table 3 for session topics.

Self-Compassion. Participants in the BWLP + SC were provided the above intervention supplemented with brief SC skills training. Self-compassion was framed as a supportive tool to nurture adaptive cognitive and behavioral changes throughout the weight loss program. The training was based on SC exercises and research by Neff (2003), and included the following topics: self-compassionate eating, self-appreciation, evaluation of critical self-talk, increasing SC through writing, journaling, and self-care. Training consisted of psychoeducation and associated discussion regarding the application of SC to support physical and psychological health. Participants were encouraged to utilize these practices independently between sessions and were assigned SC home exercises each session (based on aforementioned

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Session topics by week for weight loss and self-compassion intervention.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week</td>
<td>Session Title</td>
</tr>
<tr>
<td>Week 1</td>
<td>Welcome to the National Diabetes Prevention Program &quot;Introduction to Self-Compassion</td>
</tr>
<tr>
<td>Week 2</td>
<td>Be a Fat and Calorie Detective &quot;Self-Compassion Break</td>
</tr>
<tr>
<td>Week 3</td>
<td>Good Carb/Bad Carb &quot;Self-Compassionate Eating</td>
</tr>
<tr>
<td>Week 4</td>
<td>Three Ways to Eat Less Fat and Calories &quot;Identifying Things You Appreciate about Yourself</td>
</tr>
<tr>
<td>Week 5</td>
<td>Healthy Eating &quot;How Would You Treat a Friend?</td>
</tr>
<tr>
<td>Week 6</td>
<td>Moving Muscles &amp; Being Active – A Way of Life &quot;Changing Your Critical Self-Talk</td>
</tr>
<tr>
<td>Week 7</td>
<td>Tip the Calorie Balance &quot;Exploring Self-Compassion Through Writing</td>
</tr>
<tr>
<td>Week 8</td>
<td>Taking Charge of What’s Around &quot;Taking Care of the Caregiver</td>
</tr>
<tr>
<td>Week 9</td>
<td>Problem Solving &amp; 4 Keys to Healthy Eating Out &quot;Talk Back to Negative Thoughts</td>
</tr>
<tr>
<td>Week 10</td>
<td>Identifying What We Really Want &quot;Supportive Touch</td>
</tr>
<tr>
<td>Week 11</td>
<td>The Slippery Slope of Lifestyle Change</td>
</tr>
<tr>
<td>Week 12</td>
<td>Looking Back and Looking Forward &quot;Reflection on Self-Compassion</td>
</tr>
</tbody>
</table>

Note. a Self-Compassion Topics – Not included in the standard behavioral weight loss program.
topics). These home exercises were then discussed as a group at the following session. See Table 3 for session topics.

2.4. Measures

Godin-Shephard Leisure-Time Physical Activity Questionnaire (GSLTPAQ; Godin, 2011; Godin & Shephard, 1985). This investigation assessed the intensity and frequency of strenuous, moderate, or mild weekly physical activity from the GSLTPAQ. At the time of development, the GSLTPAQ demonstrated good concurrent validity, and two-week test–retest reliability coefficients of 0.94, 0.46, 0.48 for strenuous, moderate, and light exercise, respectively (17).

Dietary History Questionnaire III (DHQ-III; Subar et al., 2001)). The current study utilized the past month with portion size version of the DHQ-III. The DHQ-III assesses intake of 135 foods and beverages as well as 26 dietary supplements. Participants’ total calories, macronutrients in relation to total calories (e.g. percent of calories from fat, saturated fat, carbohydrates, and protein), and Healthy Eating Index-2015 (HEI; index assessing compliance with the Dietary Guidelines for Americans (Reedy et al., 2018); were used in this investigation.

Binge Eating Scale (BES; Gormally, Black, Dastin, & Rardin, 1982)). The BES is a 16-item self-report measure which identifies symptoms of binge eating with higher scores indicating greater severity of binge eating. Test–retest reliability for the BES is good ($r = 0.87$). The BES has sensitivity of 0.85 and specificity of 0.20 for identifying binge eating disorder (using a cut-score $> 27$; (Celio, Wilfley, Crow, Mitchell, & Walsh, 2004). In the current study, internal reliability was good ($\alpha = 0.86$).

Intuitive Eating (IES-2; Tylka & Kroon Van Diest, 2013)). The IES-2 is a 23-item questionnaire which measures the respondent’s intuitive eating behaviors (i.e., tendency to follow their physical hunger and satiety cues when determining when, what, and how much to eat) using a 5-point Likert scale. The total IES score was used in this investigation. The IES-2 total score has good reliability using Cronbach’s alpha ($\alpha = 0.88$ for women and $\alpha = 0.89$ for men) and good discriminant and construct validity (Tylka & Kroon Van Diest, 2013). In the current study, reliability was adequate ($\alpha = 0.70$).

Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994). The EDE-Q is a 28-item self-report questionnaire which assesses disordered attitudes and behaviors related to eating. Respondents are asked to report frequencies of their behaviors over the previous 28 days and rate attitudes using a scale of 0–6. The four subscales are restraint, eating concern, shape concern, and weight concern. The EDE-Q has been found to have acceptable reliability in a community sample ($\alpha = 0.78$; (Lev-Ari, Bachner-Melman, & Zohar, 2020). In the current study, the EDE-Q total score demonstrated excellent internal consistency ($\alpha = 0.89$).

Self-Compassion Scale (SCS; Neff, 2003). The Self-Compassion Scale (SCS) is a 26-item assessment of respondents’ SC beliefs and practices (Neff, 2003). The SCS asks respondents to rate options using a 5-point Likert scale. The SCS total score was used in this study. The SCS also rates participants on six subscales: self-kindness, self-judgement, common humanity, isolation, mindfulness, and overidentification with feelings. This measure has shown good internal consistency with a Cronbach’s alpha of .92. Test-retest reliability for the total score is 0.93 and 0.80-0.88 for the six subscales (Neff, 2003). In the current study, the SCS demonstrated adequate internal consistency for total score ($\alpha = 0.71$).

Assessment of Telehealth and Self-Compassion Components. After the study concluded, participants were asked to complete a 9-item, 5-point Likert scale survey which assessed their perceived accessibility and engagement as related to using the Webex platform for weekly groups. This survey aimed to assess ease of use (e.g., “It was hard to use Webex to attend weekly groups”), perceived accountability (e.g., “I felt a sense of accountability while participating in the online group”), and engagement with other group members (e.g., “I enjoyed talking to other group members through video chat”). Lastly, participants were asked an open-ended “free text” question in which they could include any final thoughts or feelings on the program. Also, participants in the BWLP + SC were asked to complete an additional survey at the conclusion of the study to assess acceptability of the SC intervention (e.g., “changing your critical self-talk,” “SC journal”). Participants were asked to rate each weekly SC exercise using a 5-point Likert Scale.

3. Results

3.1. Attrition

Of the 54 participants that either attended orientation or viewed a recorded orientation session, 49 (91%) of participants attended at least one class (BWLP: $N = 26$) and (BWLP + SC: $N = 23$) and 34 participants (63%) attended post-treatment weight in’s (BWLP: $N = 16$) and (BWLP + SC: $N = 18$). However, five participants failed to complete post-treatment questionnaires and one participant outlier was removed after reporting perfect scores on several measures, including self-compassion. Thus, for post-treatment questionnaires, 29 participants were included in the final analysis (BWLP: $N = 15$) and (BWLP + SC: $N = 14$). Of those who attended at least one class and completed post weight in, the mean number of classes attended was 9.9 (SD = 1.7; 83%). The BWLP group ($M = 9.6, SD = 2.67$; range = 2–12) did not significantly differ from BWLP + SC ($M = 10.29, SD = 1.49$; range = 8–12) in terms of number of sessions attended ($t = 0.85, p = .41$). Of those who attended at least one class, 82.6% of BWLP + SC participants completed greater than six classes versus 57.7% of BWLP participants, but the difference failed to reach conventional levels of statistical significance $X^2 (1, N = 49) = 3.6, p = .06$. Of those who completed the program, 100% of BWLP + SC participants completed greater than six classes versus 94% of BWLP participants, $X^2 (1, N = 34) = 1.16, p = .28$.

3.2. Group differences at baseline

Independent t-tests were used to examine group differences in demographic variables at baseline. Group differences were not found regarding age, sex, sexual orientation, race, ethnicity, or baseline BMI and weight. However, despite randomization, both education ($p = .04$) and income ($p = .005$) were significantly different between treatment groups, with the BWLP + SC having modestly lower income and less education as compared to the BWLP. See Table 1. Education and income were not associated with any outcomes including weight loss, nutrition, eating patterns, or physical activity at baseline or at post treatment. Additionally, differences were not found at baseline for SC.

3.3. Self-compassion correlations

Associations between SC and other variables at baseline were examined. SC was positively correlated with intuitive eating ($r = 0.65, p < .001$) and negatively correlated with binge eating ($r = -0.55, p < .001$), concerns about eating patterns ($r = -0.49, p < .01$) and the total composite score for the EDE-Q ($r = -0.41, p = .01$). It was also negatively correlated with shape concerns ($r = -0.45, p = .01$) and shape/body image concerns ($r = -0.46, p = .01$). SC was not correlated with weight, BMI, physical activity, healthy eating or caloric intake.

3.4. Treatment outcomes

A repeated measures ANOVA was performed in order to examine overall participant change as well as group differences (see Table 2). Both weight and BMI were significantly reduced from baseline to the post-treatment but no significant between group differences were observed. Total caloric intake was reduced and calories from protein were increased significantly from baseline to the post-treatment. No significant change was seen in percent calories from fat, saturated fat,
and carbohydrates, or the healthy eating index. Participants in both groups also reported significantly greater physical activity and intuitive eating and significantly less binge eating, eating disorder concerns, and body image/shape concerns. Overall, no significant between group differences were observed except for SC. Regarding SC, there was a significant interaction between change in SC and treatment group (F(1, 24) = 6.90, p < .05, η² = 0.22). There was significantly greater improvement in the BWLP + SC relative to the BWLP.

3.5. Baseline and post-treatment means

For both groups, the EDE-Q and subscales Restraint, Eating Concerns, Shape Concerns and Weight Concerns scores at baseline and outcome were similar to the original mean value of the community sample (Fairburn & Beglin, 1994; see means in Table 2), though significant improvement was seen for Eating Concerns, Shape Concerns and Weight Concerns among both groups in this investigation. The current sample for both groups were one SD below the community sample for intuitive eating at baseline, but were similar to the mean value of the original sample after treatment, suggesting an improvement for both groups from low intuitive eating to moderate intuitive eating (Tylka et al., 2013). At baseline, the current sample for both groups reported severe binge eating, but decreased to moderately high after intervention (Gormally et al., 1982). Rates of self-compassion were moderately similar to clinical norms reported in the SCs article, though BWLP + SC’s post score approached a rate of higher self-compassion (score = 22; Neff, 2003).

3.6. Participant perceptions of telehealth

Participant perceptions regarding the online weight loss groups were assessed. A total of 24 (70.5%) participants responded to the survey. The majority of these participants felt that the online platform was: 1) easy to use (87.5%), 2) allowed for connections with other group members (66.7%), 3) kept them accountable (91.7%), and 4) was just as effective as an in-person weight loss group (83.3%). Eighty-eight percent of participants reported that they would likely attend an online weight loss group again. Regarding the open-ended questions, three participants indicated that they live in a rural setting away from the college and especially enjoyed the online format. One participant reported internet connectivity was a barrier.

3.7. Participant perceptions of self-compassion

For those in the BWLP + SC condition, acceptability of the SC intervention was assessed. This included their numeric evaluation (1 = Not a fan; 2 = Disliked; 3 = Neutral; 4 = Liked; 5 = Loved) on each of the weekly SC topics and exercises, and how useful they perceived SC to be overall for weight management, improving health behaviors, and improving mood and well-being. The most highly rated exercises included: “how would you treat a friend”, “changing self-critical talk”, and “taking care of the caregiver” (M = 4.03). The lowest ranked topics included “SC journal”, “SC letter writing”, and “SC motivation” (M = 3.3). Participants evaluated SC training to be “moderately useful” to “very useful” for weight management (M = 3.75), improving health behaviors (M = 3.75), and improving mood and well-being (M = 4.25).

Two broad themes emerged from the open-ended questions: 1) SC helped some participants engage in less self-criticism and rebound after disappointment (e.g., “I liked the SC discussion in terms of when things weren’t going well to not beat yourself up and get back on track that next day”) and 2) some participants indicated that SC was not that helpful for them personally, possibly reflecting differential benefits (i.e., “For some in the group, it seemed to help. I just did not personally find it all that helpful”).

4. Discussion

The primary aim of the current investigation was to examine the efficacy, feasibility, and acceptability of adding SC skills training to a standard behavioral weight loss program (BWLP + SC), with the secondary aim of replicating prior research utilizing video conferencing technology to deliver a small group, weekly BWLP. The addition of SC skills training was motivated by research indicating that: 1) eating pathology is common in individuals with overweight/obesity and those who engage in counterproductive weight loss efforts and 2) individuals who engage in maladaptive eating are often low in SC (Braun et al., 2016). Therefore, it was hypothesized that teaching participants to substitute judging oneself, unproductive rumination, and dwelling on imperfections, with a sense of mindfulness and self-kindness, would not only improve weight loss outcomes and reduce maladaptive eating, but also be welcomed by participants (Neff, 2003; Rahimi-Ardabili et al., 2018). Despite a significant increase in SC in the BWLP + SC group relative to the BWLP group, treatment outcomes were not improved among BWLP + SC participants. Interestingly, participants tended to improve on maladaptive eating measures regardless of treatment group suggesting that while SC skills training is beneficial, a standard BWLP may alone also reduce maladaptive eating behaviors, albeit through different therapeutic means or mechanisms.

The null findings related to SC and weight loss were surprising. Consistent with previous research, this investigation observed that individuals low in baseline SC were reporting significantly higher binge eating, greater eating disorder concerns and features, including body and shape concerns, and lower intuitive eating (Braun et al., 2016; Schoenefeld & Webb, 2013; Webb & Hardin, 2016); therefore, it was assumed that increases in SC would be associated with improvements among these variables. However, it is possible that the benefits of SC training for eating behavior and weight loss are gradual in nature and may be more relevant to weight loss maintenance (i.e., Van Dyke & Drinkwater, 2014). For example, several participants alluded to the utility of SC practices to buffer them from discouragement in their program evaluation, enabling them to “bounce back” and recommit to their goals after challenges. Therefore, it is possible that cultivating the skill of SC could reduce the propensity of shame and discouragement arising from setbacks or weight regain following the conclusion of the program (i.e., Biber & Ellis, 2019; Schoenefeld & Webb, 2013). Finally, it may be that SC is conditionally beneficial (e.g., specifically for individuals lower in initial SC or those with psychological vulnerabilities) or was inadequately dosed. These will be important inquiries for future research.

In this investigation, over the course of treatment, participants lost on average 7.2 lbs or 3.3% of their body weight. Other gains included a significant reduction in total calories, increased physical activity, a reduction in maladaptive eating patterns, and an increase in intuitive eating. While the use of various forms of technology in weight loss treatment has shown promise (Hutchesson et al., 2015), utilizing video conferencing software (e.g., Webex) to synchronously deliver an interactive BWLP has rarely been used. Nevertheless, this technology holds the promise of making interventions more cost-effective, accessible for hard to reach populations, and suitable when face-to-face contact needs to be minimized (e.g., COVID-19 pandemic; Wosik et al., 2020). Participants completed an optional survey on program satisfaction and the results were promising. In general, participants indicated that the technology was easy to use and created few barriers for participation. They also felt the online groups were effective and they indicated that they would likely participate in an online weight loss group again.

Despite advances in eHealth and telemedicine in weight loss treatment, the utilization of synchronous video conferencing software is still relatively uncommon (Bian et al., 2017; Huang et al., 2019; Joiner et al., 2017). Several similar studies are discussed below. In a study delivered to 32 men with obesity, utilizing curriculum based on the Diabetes Prevention Program, participants lost 7.9 lbs or 3.5% of body weight...
following a 12-week group intervention (Azar et al., 2015). In the current investigation, while, men lost on average, 14.6 lbs. or 6.1% of their body weight, the generalizability of our findings are greatly limited, because only five men completed the investigation. Two studies employed a 15-week, behavioral approach entitled, Eat Smart, Move More, Weigh Less. In the first study, participants lost 8.0 lbs or 4.1% of their body weight (Dunn et al., 2014) and in a second study, participants lost 4.2 lbs or 1.8% of their body weight (Dunn et al., 2016). Consistent with our program’s findings, participants reported satisfaction with the real-time, online delivery of the program (Dunn et al., 2014). Another study delivered a 12-week intervention which included virtual meetings (weekly with a dietician, monthly with a doctor), and an accelerometer, blood pressure monitor, and body composition scale for each participant (Alencar et al., 2019). Participants lost 16 lbs or 7.2% of their body weight over 12 weeks. The current investigation’s outcomes are quite consistent with other interventions employing synchronous video-conferencing/distance education technology. With internet currently accessible to 90% of Americans and home-based broadband to 79% of Americans (Pew Research, 2018), a once significant barrier to the delivery of internet-based videoconference interventions for weight loss is quickly diminishing.

Despite strengths, such as its utilization of synchronous video conferencing technology and the addition of SC skills training as an adjunct treatment, this investigation has several weaknesses and considerations. First, while participants’ feedback of the intervention was positive, the intervention appeared to be perceived as more valuable/beneficial to some participants than others. Even with levels of SC comparable to prior studies (Hilbert et al., 2015; Neff, 2003), it is unlikely that all BWLP + SC participants desired or benefited from SC skills training. Second, measures of treatment fidelity were not assessed, leaving open the possibility of poor fidelity in SC treatment delivery. Third, the effects of the SC condition may have been diminished due to low dose of the SC skills training (i.e., 15–30 min each week). Fourth, other indicators of well-being not assessed in this investigation may have improved following SC skills training (e.g., depression). Finally, the limited number of participants that completed the intervention severely limited statistical power to detect small to moderate effects between groups. However, because the weight loss between groups was nearly identical, low statistical power was unlikely to account for the null findings.

In addition, consistent with other less intensive interventions (Heshka et al., 2003), attrition in the current investigation was quite high (37%). Also, self-selected participants in a virtual weight loss program further limit the generalizability of the findings to individuals who are not interested in a virtual weight loss intervention. Interestingly, the median household income in this investigation was high (between $90,000–99,000), and 48% of participants had a graduate or professional degree. This level of education and affluence may have: 1) enhanced interest in a technologically based intervention, and 2) increased the likelihood of access to and experience with high-speed broadband internet. Future research with lower SES and less educated participants will be important. Additionally, unknown factors related to the COVID-19 pandemic, such as difficulty exercising, social isolation and distancing, stress, or other possible barriers which occurred concurrently with this intervention, may have also influenced outcomes. While the Diet History Questionnaire is known to underestimate total caloric intake relative to 24-h dietary recall (Subar et al., 2001), the relative change in caloric intake is likely to be less affected. In addition, the current study would likely have benefitted from a formal assessment of BWLP + SC participants use of SC outside of sessions, rather than simply informal discussions, to obtain further insight into dose of the SC intervention. Finally, the additional time and attention that the BWLP + SC group received relative to the BWLP is a potential confound and the lack of follow-up to determine weight loss maintenance is a weakness.

The promising results from the current investigation suggest that the utilization of video conferencing software and the application of SC principles to the treatment of obesity may have merit. However, it will be important to make more direct comparisons of virtual to face-to-face weight loss treatments as well as examine SC delivered via different modalities, length of treatment, and follow-up. While the overall conclusions are limited by the small number of participants in this investigation, the current preliminary research offers support to continue investigating both SC skills training and virtual technology platforms in the delivery of weight loss research.

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