**Self-compassion and body image inflexibility as mediators of outcomes in a residential eating disorder sample**

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**Abstract**

 Eating disorders are serious mental health conditions that are accompanied by negative health outcomes, high mortality rates, impaired functioning, and comorbid mental health conditions. Despite many empirically supported interventions for eating disorders, it remains one of the most challenging mental disorders to treat, as individuals often struggle to maintain treatment gains. One method of improving our understanding of effective eating disorder treatment is to identify important processes of change to target during therapy. The aim of the current study was to test two candidate mediators of disordered eating symptom change during residential treatment: self-compassion and body image inflexibility. In the present study, women and adolescent girls (N=132) completed a battery of measures, including eating disorder severity, self-compassion, and body image inflexibility, at admission to and discharge from a residential eating disorder facility. Our results indicated that changes in body image inflexibility and self-compassion, specifically self-judgment, were both mediators between ED symptom severity from pre- to post-treatment. These results have potential treatment implications, pointing to the possible importance of targeting body image inflexibility, self-judgment, and self-compassion while treating eating disorders.

 *Keywords*: self-compassion, eating disorders, body image inflexibility, women, adolescent girls

**Self-compassion and body image inflexibility as mediators of outcomes in a residential eating disorder sample**

Eating disorders (ED) are serious mental health conditions that have an estimated lifetime prevalence of 4.9% for women and 2.2% for men (Duncan et al., 2017). Eating disorders are predominant among young women, with a mean age of onset at roughly 18 years (Volpe et al., 2016) and prevalence at age 20 estimated at roughly 15.6% (Hay et al., 2015). Eating disorders, including anorexia nervosa, bulimia nervosa, binge eating disorder, other specified feeding or eating disorders, can be fatal (Smink et al., 2012) and are associated with poor psychosocial functioning and decreased quality of life (Klump et al., 2009; Dejong et al., 2013). Fortunately, there are empirically supported treatments available within outpatient and inpatient settings (see Zeeck et al., 2018). Psychological treatments that have received the most support (e.g., cognitive behavior therapy; Brownley et al., 2007) are those that intentionally target the underlying processes that lead to the development and maintenance of ED, like restrictive eating behaviors and body dissatisfaction (Fairburn, 2008).

Despite empirically supported interventions for ED, it remains one of the most challenging disorders to treat. Global outcomes for those receiving treatment for anorexia nervosa have been relatively poor, with just under half of patients making a full recovery at post-treatment and one third reaching partial recovery (Steinhausen, 2002). It may be that underlying transdiagnostic psychological processes associated with eating disorders such as perfectionism, distorted cognitions, and cognitive inflexibility are accounting for greater treatment resistance among those with ED and subsequently affecting outcomes at post-treatment (Halmi, 2013). Pinpointing these processes aligns with the model of process-based therapy (PBT), in which the presence of underlying processes is integrated into case conceptualization and used to guide clinical decision making. Understanding the extent to which specific psychological processes contribute to an individual’s presenting problem is central to determining the therapeutic strategies that will be most effective when targeted (Hofmann & Hayes, 2018).

**Psychological inflexibility**

Psychological inflexibility is one process of change that has received recent attention within ED research. Psychological inflexibility is characterized by a need for control over or rigidity in response to thoughts, emotions, or other internal experiences; this need for control often leads to avoidance and interference with personally held values (Levin et al., 2014). Inversely, psychological flexibility is an adaptive process that promotes openness to internal experiences so that individuals can live a fulfilling life by behaving in accordance with what is meaningful to them (e.g., their chosen values). Associations between psychological inflexibility and eating disorder symptoms have been well documented across studies of clinical and non-clinical samples (Levin et al., 2014; Merwin et al., 2010). Moreover, psychological inflexibility may play an even more salient role in the development and maintenance of ED symptoms over and above distorted cognitions (Masuda et al., 2010, 2014).

Psychological inflexibility has been framed in the context of ED as body image inflexibility to highlight the nuanced cognitive processes and behaviors specific to eating disorders (e.g., Wendell et al., 2011). The construct is commonly measured using the Body Image – Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013). While ED-like cognitions (e.g., “thin is ideal”) may occur among healthy individuals, it has been postulated the ED pathology arises as a result of one’s way of relating to these cognitions (Rawal et al., 2010). Among those exhibiting ED pathologies, body image inflexibility reflects a perceived need to exert self-control over diet and the fear of gaining weight (Fairburn et al., 2003). In a non-clinical sample of college students, Wendell et al., (2012) demonstrated that body image inflexibility partially explained the relationship between ED-related cognitions and disordered eating. These findings suggest the potential relevance of body image inflexibility as a risk factor and maintenance factor of eating disorder symptoms.

 Developing flexibility towards body image concerns may involve developing acceptance around thoughts and feelings towards one’s body, gradually choosing actions that are more in line with what they care about as a person, rather than how they look (e.g., choosing to wear a bathing suit and go swimming with their children even though body dissatisfaction is present). Body image flexibility, as measured by the BI-AAQ, is associated with general psychological flexibility, and less disordered eating cognitions and eating pathology (Sandoz et al., 2013). In a study of young women in residential treatment, pre-treatment body image flexibility significantly predicted improved quality of life and reductions in ED severity at post treatment (Bluett et al., 2016). A later study using the same sample reported that improvements in body image flexibility over the course of residential treatment predicted changes in outcomes, including eating disorder symptomatology and quality of life (Lee et al., 2017). Fostering psychological inflexibility in the context of body image concerns stands as the primary goal of acceptance-based interventions for EDs, which have been receiving an emergence of empirical support (see Di Sante et al., 2022). Taken together, body image flexibility may be a viable target in the treatment of ED that warrants further examination.

**Self-compassion**

Another adaptive process with potential clinical implications for ED is self-compassion, given the central role of self-criticism and punishment within ED pathology (e.g., Kelly & Carter, 2011; Gilbert et al., 2004). Neff (2003) defines self-compassion as self-kindness amid suffering, accepting one’s life events as a part of the human experience, and allowing oneself to simply be aware of uncomfortable inner experiences rather than identifying with them. Self-compassion and psychological flexibility conceptually overlap, but self-compassion has received less clinical attention relative to psychological flexibility within ED research.

Much of the previous research on the role of self-compassion in eating disorder symptoms has come from non-clinical samples (e.g., Homan & Tylka, 2015; Wasylkiw et al., 2012; Webb & Forman, 2013). These preliminary studies have reported an association between self-compassion and more adaptive beliefs about body image and eating behaviors (Homan & Tylka, 2015; Kelly et al., 2014). The absence of self-compassion may contribute to self-punishing behaviors such as food restriction, binge eating, and purging. Conversely, engaging in ED behaviors might serve as a way to control and manage feelings of shame (Goss & Gilbert, 2002). For these reasons, there is a belief that self-compassion holds theoretical significance as a treatment target for individuals with EDs.

This thinking has sparked an increased interest in exploring how the cultivation of self-compassion can improve outcomes in the treatment of EDs. Kelly and colleagues (2014) found that the development of self-compassion early in treatment predicted decreases in ED symptoms across a 12-week treatment program, suggesting that that self-compassion may help to amplify treatment effects. In a separate study, patients who were resistant to self-compassion (“fear of self-compassion”) had more severe ED symptoms and experienced worse treatment response (Kelly et al., 2012). In the first pilot randomized trial of self-compassion training for patients with binge eating disorder, self-compassion training performed better than control conditions (teaching behavior strategies and waitlist) in reducing ED pathology and eating and weight concerns (Kelly & Carter, 2015). In a follow-up pilot trial by Kelly et al. (2017), supplementing treatment as usual (TAU) with group-based self-compassion training in a mixed ED sample led to significantly greater improvements in ED symptomology, self-compassion, fear of self-compassion, and shame compared to twelve weeks of TAU alone. Of note, participants who received compassion-focused therapy in addition to TAU experienced clinically significant change in ED symptoms while those in TAU alone did not. Providing context to this finding, the study included a substantial number of participants who had not previously shown positive responses to TAU, underscoring the importance of targeting self-compassion, particularly for individuals with a history of treatment challenges. While the clinical utility of self-compassion is still undergoing investigation, available data suggest it may be a valuable factor in propelling ED recovery.

**The current study**

The aim of the current study was to test two candidate mediators of change in ED symptoms, self-compassion and body image inflexibility, during a residential treatment program. Residential treatment is often a critical part of the recovery process, particularly for patients with more severe ED symptoms (APA, 2006) and serves to prepare patients to return to everyday life where they can resume recovery or remain in remission with less intensive levels of care. Thus, identifying adaptive processes (e.g., psychological flexibility and self-compassion) that could serve as treatment targets may benefit patients’ recovery. To our knowledge, this is the first study to date to examine changes in self-compassion as a mediator of change in a residential ED sample. Recognizing the clinical utility of developing flexibility towards one’s body image and promoting self-compassion to address the central role of self-criticism and punishment in ED pathology, we predict that both processes will act as parallel mediators between ED symptoms at intake and discharge.

**Methods**

**Participants**

Participants in the current study were 180 females consented and were admitted to residential eating disorder treatment at a for-profit residential treatment facility located in the Western U.S. between November 2015 and June 2020. Average length of stay for clients within the residential facility is between four and six months but varies considerably due to individualized clinical, psychosocial, and insurance funding factors (*M* = 24 weeks, *SD* = 15.5). Within the total sample, n = 75 participants were admitted to the adolescent treatment facility (ages 11-17) and n = 105 were admitted to the adult treatment facility. The adult and adolescent populations within this organization do not commingle. All participants were clinically diagnosed with an eating disorder at time of admission based on Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (American Psychiatric Association, 2013) criterion via an unstructured group clinical interview with a master’s or doctoral level clinician, registered dietitian, and a nurse practitioner. Table 1 includes descriptive statistics of the study sample.

**Procedures**

All parts of the study were reviewed and approved by a university institutional review board. Convenience sampling methods were used such that all individuals consecutively admitted to the residential treatment facility within the data collection period, in addition to parents and/or legal guardians when the client was under 18 years of age, were provided information about the research study and asked if they were interested in participating. Prospective participants were informed that their participation in the study was voluntary and their choice to participate would have no impact on or connection to the clinical treatment services they would receive while admitted to the residential treatment facility. A total of 17 individual and/or legal guardians chose not to participate in the study.

Following the informed consent process, participants completed an online self-report assessment battery within three days following their admission. The assessment battery included questions about demographic information and measures of ED symptom severity, comorbid psychological symptoms, behavioral and psychological factors theorized to relate to ED psychopathology and treatment, and targeted treatment outcomes. All participants then completed the same self-report assessments within three days of their planned discharge date. Treatment at this facility is multi-disciplinary and typically involves twice weekly individual therapy, daily group therapy, and weekly family therapy. These sessions typically utilize a combination of cognitive behavioral therapy, dialectical behavior therapy, and acceptance and commitment therapy. Treatment also includes a behavioral rewards system and nutritional/medical support.

**Measures**

***Eating Disorder Examination Questionnaire* *(EDE-Q; Fairburn & Beglin, 2008)***

The EDE-Q is a self-report questionnaire containing 28 items answered on a 7-point Likert scale (0 = *No days* to6 = *Everyday*) adapted from the Eating Disorder Examination (EDE) semi-structured interview. The EDE-Q is designed to assess the frequency and severity of a range of behaviors and features frequently associated with a diagnosis of an eating disorder that the respondent has experienced within the previous 28-day period, and has been validated for use with both clinical and non-clinical samples (Berg et al., 2012). The EDE-Q items generate four subscales: 1) eating restraint, 2) eating concerns, 3) shape concerns, and 4) weight concerns. The scores on each subscale are averaged to produce an overall global score of ED symptom severity. Only global scores were used for analyses in the current study. Due to a researcher error item 8 (“In the past 28 days how has thinking about shape or weight made it very difficult to concentrate on things you are interested in?) and item 25 (“In the past 28 days how dissatisfied have you been with your weight?) were unintentionally omitted from the assessment battery at both time points. Although this is a limitation of the current study, missing data on the EDE-Q is common (Kelly et al., 2017) and the authors of the measure provide guidelines for navigating missing data indicating that valid totals can still be obtained as long as the majority of the items from each subscale contain responses (Fairburn & Beglin, 2008). In the current study, the EDE-Q demonstrated excellent internal consistency (*α* = .95).

***Self-Compassion Scale (SCS; Neff, 2003)***

The SCS is a 26-item self-report scale designed to assess various aspects of self-compassion. Items are rated on a 5-point Likert scale (1 = *Almost Never* to 7 = *Almost Always*), and the total score is calculated via a mean of each item, with higher scores indicating greater self-compassion. The measure produces a total score representing a higher order factor of self-compassion as well as six subscale factor scores: (1) Self-Kindness and (2) Self-Judgment which examine the individual's tendency to be kind and understanding toward themself in instances of pain or failure; (3) Common Humanity and (4) Isolation which examine the individual's tendency to perceive their experiences as part of the larger human experience; and (5) Mindfulness and (6) Over-Identification which examine the individual’s ability to hold painful thoughts and feelings in mindful awareness. The single bifactor structure (i.e., a single higher-order self-compassion factor and 6 subgroup lower-order factors) of the SCS has consistently been supported (as opposed to a 2-bifactor model with two correlated general factors representing compassionate and uncompassionate responding styles) and found to have adequate psychometric properties across diverse populations (e.g., Neff et al. 2019; Toth-Kiraly & Neff, 2021). In the current study, the SCS demonstrated poor internal consistency for the total score (*α* = .52), but good reliability within each subscale (*α*s = .81 - .88).

***Body Image Acceptance and Action Questionnaire (BI-AAQ; Sandoz et al., 2013)***

The BI-AAQ is a 12 item self-report measure of body image flexibility (i.e., the capacity to experience all perceptions, sensations, feelings, thoughts, and beliefs associated with one's body image mindfully while engaging in patterns of values-consistent behavior). Items are rated on a 7-point Likert scale (1 = *Never true* to 7 = *Always true*), and scores are summed to produce a total score with higher scores indicative of greater inflexibility. Example items of the BI-AAQ include “Worrying about my body takes up too much of my time” and “I shut down when I feel bad about my body shape or weight.” The unidimensional structure of the BI-AAQ has been validated and found to have good psychometric properties when used with both clinical (Lee et al., 2017) and nonclinical samples (Sandoz et al., 2013). In the current study the BI-AAQ demonstrated excellent internal consistency (*α* = .92).

**Analyses**

 All analyses took place with R in RStudio (R Core Team, 2021). Only participants who completed both pre- and post-treatment surveys were included in analyses and each questionnaire had to be at least 25% complete to be included (total N after removal = 132; 47 of which were participants who completed pre- but not post-questionnaires). Multiple imputation was used for all other missing data (percentage of items missing across questionnaires ranged from 0.75 – 2.2%). Correlations and general descriptives were calculated and can be found in Tables 1-3. Change scores were calculated by subtracting pre-treatment scores from post-treatment scores and utilized in mediation models. Standardized mediation models were utilized to test pre- to post-treatment total and subscale SCS and BI-AAQ scores as mediators individually and together between pre-treatment total EDE-Q and post-treatment total EDE-Q.

**Results**

**Descriptives and correlations**

See Table 1 for all means and standard deviations for variables at admission and discharge from treatment. As expected, the sample at the beginning of their residential treatment reported clinically elevated EDE-Q and BI-AAQ scores. For self-compassion at admission, the average total score was 2.26 (SD = .77).

All variables at pre-treatment were also tested for correlations. All correlations were significant (*p* < .001). and in the expected directions. In brief, the EDE-Q and the BI-AAQ were negatively correlated with the total SCS score, along with the Common Humanity, Mindfulness, and Self-Kindness SCS subscales. The EDE-Q and BI-AAQ were positively correlated with the Self-Judgment, Isolation, and Overidentification SCS subscales. The BI-AAQ and EDE-Q were positively correlated with each other. On average, participants reported decreases in disordered eating and psychological inflexibility at post-treatment. Participants also reported improvements in self-compassion overall and all the subscales.

**Mediation analyses**

**Self-compassion: Total and subscales.** First, pre-treatment EDE-Q was tested as a predictor of post-treatment EDE-Q scores. A significant effect was found (*β* = .18, SE = .09, *p* < .05, R2 = .034). Pre-treatment EDE-Q was then tested as a predictor of the total SCS change score. A significant effect was found (*β* = .28, SE = .08, *p* = .001, R2 = .077). Lastly, total change in SCS was tested as a predictor while controlling for EDE-Q score at pre-treatment. A significant effect was found for both total change in SCS (*β* = -.43, SE = .08, *p* < .001) and pre-treatment EDE-Q (*β* = .30, SE = .08, *p* < .001). This suggests a mediational effect of total change in SCS (*R2* = .20) between pre- and post-treatment EDE-Q.

Given that change in total SCS was found as a significant individual mediator, pre- to post-treatment change in each subscale of the SCS (self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification) was tested as an individual mediator between pre- and post-treatment EDE in the same manner described previously. Changes in common humanity and mindfulness were not significantly predicted by pre-treatment EDE and thus did not meet criteria as a mediator.

Pre-treatment EDE-Q was found as a significant predictor of change in self-kindness (*β* = -.28, SE = .08, *p* = .001, R2 = .08). Change in self-kindness retained significance (*β* = -.37, SE = .08, *p* < .001) when included alongside pre-treatment EDE (*β* = .28, SE = .08, *p* < .001) as predictors of post-treatment EDE (*R2* = .16). Similarly, pre-treatment EDE-Q was found as a significant predictor of change in self-judgment (*β* = -.36, SE = .08, *p* < .001, R2 = .13). Change in self-judgment retained significance (*β* = .56, SE = .08, *p* < .001) when included alongside pre-treatment EDE (*β* = .38, SE = .08, *p* < .001) as predictors of post-treatment EDE (R2 = .30). Change in isolation was also significant predicted by pre-treatment EDE (*β* = -.28, SE = .08, *p* = .001, R2 = .08). Change in isolation similarly retained significance (*β* = .36, SE = .08, *p* < .001) when included alongside pre-treatment EDE (*β* = .28, SE = .08, *p* < .001) as predictors of post-treatment EDE (R2 = .15). Lastly, change in overidentification was significantly predicted by pre-treatment EDE (*β* = -.27, SE = .08, *p* = .002, R2 = .07). Change in overidentification retained significance (*β* = .40, SE = .08, *p* < .001) when included alongside pre-treatment EDE (*β* = .29, SE = .08, *p* < .001) as predictors of post-treatment EDE (*R2* = .19).

Lastly, change in self-kindness, self-judgment, isolation, and overidentification were included in one large mediational model as parallel mediators to better discern the mediational effects between them. Only pre-treatment EDE (*β* = .38, SE = .08, *p* < .001) and change in self-judgment (*β* = .53, SE = .13, *p* < .001) retained significance in this full model (*R2* = .31).

**Body image psychological inflexibility**. The same process was followed for testing the BI-AAQ as an individual mediator between pre- and post-treatment EDE scores. As found previously, pre-treatment EDE was significantly associated with post-treatment EDE. Pre-treatment EDE was then tested as a predictor of the total change in BI-AAQ and a significant effect was found (*β* = -.49, SE = .08, p < .001, *R2* = .24). Total change in BI-AAQ was then tested as a predictor while controlling for pre-treatment EDE. A significant effect was found for both change in BI-AAQ (*β* = .77, SE = .07, p < .001) and pre-treatment EDE (*β* = .56, SE = .07, p < .001). This result also suggests a mediational effect of total change in BI-AAQ (*R2* = .48) between pre- and post-treatment EDE.

**Parallel mediation model**. Because of the significant results with change in total SCS, change in self-judgment, and change in BI-AAQ as predictors, total change in BI-AAQ and SCS were tested together as parallel mediators between pre- and post-treatment EDE. Both change in BI-AAQ (*β* = .70, SE = .08, p < .001) and change in SCS (*β* = -.13, SE = .07, p < .001) retained their significance in the new model (R2 = .49). Pre-treatment EDE remained a significant predictor (*β* = .57, SE = .07, p < .001), suggesting that change in BI-AAQ and SCS are only partial mediators. Next, total change in BI-AAQ and self-judgment were tested together as parallel mediators between pre- and post-treatment EDE. We elected to run two separate models because of concerns related to including total SCS and a subscale of SCS scores in the same model. Both change in BI-AAQ (*β* = .62, SE = .08, p < .001) and change in self-judgment (*β* = .26, SE = .07, p < .001) retained their significance in the new model (R2 = .52). Pre-treatment EDE remained a significant predictor (*β* = .58, SE = .07, p < .001), again indicating that change in BI-AAQ and self-judgment are only partial mediators. Because of the slightly higher R2 value of the model including change in self-judgment and BI-AAQ, we elected to utilize this mediation model as the final model (see Figure 1).

**Discussion**

The present study aimed to assess self-compassion and psychological flexibility as mediators of change in ED symptoms during residential treatment. There have been several studies examining the relationship between body image inflexibility (Lee et al., 2017) or self-compassion (Kelly et al., 2014) and change in ED symptoms. However, this is the first study, to our knowledge, to examine both as mediators of change within a residential ED sample.

At intake, participants reported clinically elevated levels of ED symptoms, consistent with past residential samples (Aardoom et al., 2012). Levels of body image inflexibility and self-compassion reported during intake aligned means observed in previous studies involving individuals with eating disorders and other clinical samples (Luceno-Santos et al., 2017; Kelly et al., 2014). Correlations between all variables at intake were also examined. ED symptom severity and body image inflexibility were negatively correlated with total self-compassion (i.e., SCS total score) and the common humanity, mindfulness, and self-kindness SCS subscales. Additionally, ED symptom severity and body image inflexibility were positively correlated with the self-judgment, isolation and overidentification SCS subscales. Finally, body image inflexibility and ED symptom severity were positively correlated. These correlations are all in the expected directions and are consistent with theory and previous research (e.g., Kelly et al., 2014). Of note, the strongest correlation of the SCS subscales with the BI-AAQ was the relationship between body image flexibility and self-judgment. This finding is consistent with the growing literature on self-compassion and body image, which suggests that self-judgment is a key variable of interest when targeting disordered eating and body image-related issues (e.g., weight self-stigma, body dissatisfaction; Perey & Koenigstorfer, 2020). Overall, these findings suggest that self-compassion and body image inflexibility are related to ED symptom severity, adding to the previous literature supporting these associations.

**Mediation Outcomes**

Total change in self-compassion and the self-kindness, self-judgment, isolation, and overidentification subscales were all significant individual mediators between ED symptom severity at pre- and post-treatment. When all these mediators were included in one large model, only pre-treatment ED symptom severity and changes in self-judgment remained significant. These findings suggest that change in self-judgment acts as a significant partial mediator between pre- and post-treatment ED symptom severity. Additionally, consistent with previous research (e.g., Kelly et al., 2014), our findings suggest that improvements in self-judgment may be aligned with improvements in ED symptoms; however, further research is necessary. These findings contribute to the current literature supporting the overall role of self-compassion in ED treatment. Based on our analyses, the self-judgment component of self-compassion appears to play a key role in ED symptomatology and change during treatment.

Changes in body image inflexibility also acted as a partial mediator between ED symptom severity at pre- and post-treatment. This finding is consistent with previous literature supporting the role of psychological inflexibility, particularly related to body image, may play in ED symptom severity (e.g., Bluett et al., 2016; Lee et al., 2017). For example, Wendell (2011) also found that body image inflexibility was a mediator of change in ED symptoms and cognitions. In the same study, body image inflexibilty was a partial mediator of body image acceptance and non-specific psychiatric symptoms, but it did not mediate the relationship between body image acceptance and ED symptom severity (Wendell, 2011). Based on these findings and the current study, there appears to be nuance in the relationship between ED symptom severity at pre- and post- treatment that is not fully captured in body image inflexibilty; it is possible that acceptance relating to self-judgment on a whole rather than simply relating to the body is another key factor.

With this in mind, we examined changes in total self-compassion and body image inflexibility as parallel mediators between pre- and post-treatment ED severity, as well as changes in self-judgment and body image inflexibility as parallel mediators in another model. Both models were significant, suggesting that the combination of change in body image inflexibility with changes in total self-compassion and in self-judgment are significant partial mediators. However, the model including changes in body image inflexibility and changes in self-judgment had a greater *R2* value.

Overall, these findings add to the current literature by highlighting the importance of targeting self-compassion, specifically self-judgment, in addition to body image inflexibility during treatment for eating disorders. Broadly speaking, psychological flexibility has been associated with ED symptom severity and is predictive of symptom severity over time (e.g., Bluett et al., 2016). However, the results of this study suggest that body image inflexibility is a partial mediator in addition to self-compassion. This suggests that self-compassion may add a complementary component alongside body image flexibility. For example, in the study by Kelly and colleagues (2012), participants with EDs who had greater resistance to self-compassion also had poorer treatment outcomes. Perhaps building body image flexibility alongside interventions targeting increased self-compassion could improve treatment outcomes, but further research is needed.

**Clinical Implications**

In the context of a residential sample, the results of the current study suggest that changes in self-compassion, specifically self-judgment, and body image flexibility mediate the relationship between pre- and post-treatment ED severity. This suggests that focusing on self-judgment and body image flexibility may be especially beneficial in the treatment of eating disorders, particularly within higher levels of care. For example, these results point towards the utility of treatments such as Acceptance and Commitment Therapy (ACT) and Compassion -Focused Therapy (CFT), which target psychological flexibility and self-compassion respectively. Alternatively, the integration of treatment strategies that focus on building psychological flexibility and/or self-compassion may be particularly beneficial. It may also be beneficial for clinicians to assess body image flexibility and self-judgment throughout treatment as a way to track improvement outside of ED severity. Lastly, it may be important to consider clinical differences in presentation related to eating disorder diagnosis and/or age of the patient when implementing strategies targeting body image inflexibility and/or self-compassion. Future research may explore how age and diagnosis impact progress in treatments utilizing these concepts.

**Limitations**

The findings of the present study potentially contribute to our growing understanding of the psychological factors related to improvement during residential treatment of eating disorders. However, there are several limitations. First, the sample is all-female, and much research shows that self-compassion specifically presents differently across genders (e.g., Yarnell, Neff, et al, 2019; Yarnell, Stafford, et al., 2015). Future research should aim to assess the role of changes in self-compassion on ED symptom severity with a gender diverse sample. Additionally, the residential sample is both a strength and a limitation. Residential level of care is not necessarily generalizable to the average clinical population; however, it still has utility in adding to our understanding of how self-compassion and body image inflexibility may present across the spectrum of clinical presentations. Future research should aim to assess self-compassion and psychological inflexibility in a clinical outpatient sample from public settings. Next, this study was conducted with a naturalistic sample and was therefore not highly targeted or controlled. Treatment within the residential treatment center in the present study was multi-disciplinary and comprehensive, thus making tracking of specific treatment components complicated and beyond the scope of the present study. Future research is needed in a more targeted and controlled study (e.g., randomized controlled trials, more structured treatment settings), particularly studies that assess participation in and attrition from specific treatment approaches (e.g., the implementation of self-compassion skills). Additionally, the SCS demonstrated poor internal consistency for the total score; the analyses utilizing the total score of the SCS should therefore be interpreted with caution. Future research with measures of improved internal consistency and reliability is undoubtedly needed to capture a more precise picture of the clinical process. Lastly, due to the exploratory nature of the present study, it is important to acknowledge the limitations associated with multiple testing. It is possible that the multiple analytic tests utilized in the present study may have resulted in elevated Type I error. As mentioned previously, future research on self-compassion and body image inflexibility in the treatment of disordered eating is paramount.

**Conclusion**

In conclusion, the present study aimed to assess mediators of change for ED symptom severity in a residential, female sample with eating disorders. Our results indicated that changes in body image inflexibility and self-judgment are mediators between ED symptom severity from pre- to post-treatment. Treatment implications are numerous and speak to the potential importance of targeting body image inflexibility, self-judgment, and self-compassion in the treatment of eating disorders.

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Table 1

*General descriptives for entire sample*

|  |  |
| --- | --- |
|  | Full sample(N = 132) |
| Age, M (SD) | 21.2 (8.6) |
| BMI at admission, M (SD) | 20 (4.0) |
| Ethnicity, N (%) |  |
|  White | 120 (90.9) |
|  African American/Black | 0 (0) |
|  Asian | 3 (2.27) |
|  Biracial | 7 (5.3) |
|  Native Hawaiian | 1 (.76) |
|  Declined to answer | 1 (.76) |
| Diagnosis, N (%) |  |
| AN-R | 64 (48.48) |
| AN-B/P | 47 (35.61) |
| BN | 15 (11.36) |
| BED | 3 (2.27) |
| ARFID | 1 (.76) |
| OSFED | 2 (1.52) |
| Duration of illness in years, M (SD) | 7.7 (8.7) |
| Duration of stay in weeks, M (SD) | 24.0 (15.5) |

*Note:* AN-R: Anorexia Nervosa-Restrictive Type; AN-B/P: Anorexia Nervosa-Binge/Purge Type; BN: Bulimia Nervosa; BED: Binge Eating Disorder; ARFID: Avoidant and Restrictive Food Intake Disorder; OSFED: Other Specified Feeding and Eating Disorder.

Table 2

*Pre- and post-treatment means and standard deviations for all measures using imputated data*

|  |  |  |
| --- | --- | --- |
| Measure | Pre-treatmentM(SD) | Post-treatmentM(SD) |
| Total EDE-Q | 3.88 (1.61) | 1.47 (1.29) |
| SCS Total | 2.26 (.77) | 3.05 (.87) |
| SCS Self Kindness | 2.14 (.95) | 2.91 (1.09) |
| SCS Self Judgment | 4.06 (.86) | 3.10 (1.04) |
| SCS Common Humanity | 2.51 (1.02) | 3.13 (1.01) |
| SCS Isolation | 3.86 (.88) | 2.93 (1.05) |
| SCS Mindfulness | 2.67 (.93) | 3.30 (.04) |
| SCS Overidentification | 3.84 (.88) | 2.97 (.95) |
| BI-AAQ | 61.19 (16.17) | 40.04 (17.78) |

*Note:* EDE-Q *=* Eating Disorder Examination Questionnaire; SCS = Self-Compassion Scale; BI-AAQ = Body Image Acceptance and Action Questionnaire.

Table 3

*Correlations between pre-treatment variables*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Measure | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* |
| 1. EDE-Q | — | — | — | — | — | — | — | — | — |
| 2. SCS Total | -.55\* | — | — | — | — | — | — | — | — |
| 3. SCS Self Kindness | -.52\* | .86\* | — | — | — | — | — | — | — |
| 4. SCS Self Judgment | .66\* | -.85\* | -.75\* | — | — | — | — | — | — |
| 5. SCS Common Humanity | -.27\* | .83\* | .69\* | -.53\* | — | — | — | — | — |
| 6. SCS Isolation | .50\* | -.85\* | -.63\* | .77\* | -.61\* | — | — | — | — |
| 7. SCS Mindfulness | -.38\* | .87\* | .78\* | -.59\* | .79\* | -.61\* | — | — | — |
| 8. SCS Overidentification | .49\* | -.78\* | -.52\* | .69\* | -.50\* | .72\* | -.59\* | — | — |
| 9. BI-AAQ | .74\* | -.53\* | -.43\* | .57\* | -.33\* | .52\* | -.35\* | .49\* | — |

*Note:* EDE-Q *=* Eating Disorder Examination Questionnaire; SCS = Self-Compassion Scale; BI-AAQ = Body Image Acceptance and Action Questionnaire.

\**p* < .001.

Figure 1

*Final parallel mediation model with changes in BI-AAQ and changes in SCS self-judgment.*

.62\*\*

0.26\*\*

Post-treatment

 EDE-Q

.58\*\*

BI-AAQ

-.49\*\*

-.36\*\*

Pre-treatment

 EDE-Q

SCS

Self-Judgment

*Note*. EDE-Q *=* Eating Disorder Examination Questionnaire; SCS = Self-Compassion Scale; BI-AAQ = Body Image Acceptance and Action Questionnaire. All relationships significant at *p* < .001.