The role of body image psychological flexibility on the treatment of eating disorders in a residential facility

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A R T I C L E   I N F O

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A B S T R A C T

Objective: The purpose of this study was to test whether pre-treatment levels of psychological flexibility would longitudinally predict quality of life and eating disorder risk in patients at a residential treatment facility for eating disorders.

Method: Data on body image psychological flexibility, quality of life, and eating disorder risk were collected from 63 adolescent and 50 adult, female, residential patients (N = 113) diagnosed with an eating disorder. These same measures were again collected at post-treatment. Sequential multiple regression analyses were performed to test whether pre-treatment levels of psychological flexibility longitudinally predicted quality of life and eating disorder risk after controlling for age and baseline effects.

Results: Pre-treatment psychological flexibility significantly predicted post-treatment quality of life with approximately 15% of the variation being attributable to age and pre-treatment psychological flexibility. Pre-treatment psychological flexibility also significantly predicted post-treatment eating disorder risk with nearly 30% of the variation attributed to age and pre-treatment psychological flexibility.

Discussion: This study suggests that levels of psychological flexibility upon entering treatment for an eating disorder longitudinally predict eating disorder outcome and quality of life.

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1. Introduction

Eating disorders are often long-term chronic conditions resulting in considerable physical, psychological, and social problems (American Psychiatric Association, 2013; NICE, 2004), with recent research suggesting that eating disorders be categorized as a serious mental illness (Klump, Bulik, Kaye, Treasure, & Tyson, 2009). Lifetime prevalence rates in the United States have been estimated to be 0.5% for anorexia nervosa, 1.0% for bulimia nervosa, and 2.8% for binge eating disorder (Hudson, Hiripi, Pope, & Kessler, 2007). Prior to changes in diagnostic criteria, EDNOS was considered the most common eating disorder diagnosis (Smink, van Hoeken, & Hoek, 2012). The DSM-5 has since omitted the EDNOS category, in efforts to reduce the number of individuals diagnosed with a diagnosis that was intended to be a residual classification (Fairburn & Bohn, 2005). Recent studies utilizing DSM-5 criteria show lifetime prevalence rates amongst women to be 1–4% for anorexia nervosa, 2–2.6% for bulimia nervosa, and 3.0% for binge eating disorder (Smink et al., 2012; Stice, Marti, & Rohde, 2013).

Eating disorders are notorious for being one of the most challenging psychological disorders to treat. Across levels of care, cognitive behavioral therapy (CBT) has proven to be the most effective treatment for eating disorder pathology (e.g., Brownley, Berkman, Sedway, Lohr, & Bulik, 2007; NICE, 2004; Shapiro et al., 2007). Consistent with previous research, a recent meta-analysis found CBT to be the most effective treatment compared to other active interventions, however, when directly compared to another active condition (e.g., behavior therapy) no significant differences exist (Hubbard, 2013). Of note, empirical support exists for variations of CBT and alternative treatments such as family-based therapy (FBT) has strong efficacy for the treatment of bulimia (e.g., Wilson, Grilo, & Vitousek, 2007) and bulimia (Couturier, Kimber, & Szatmari, 2013). In adults, variations of CBT protocols, such as guided self-help, has support for BED (e.g., Wilson, Wilfley, Agras, & Bryson, 2010). Notably, mindfulness-based interventions continue to gain support as a treatment for BED in adults (Godfrey, Gallo, & Afari, 2015). Moreover, research supports both individual and group manual-based CBT for the treatment of bulimia in adults (Wilson et al., 2007). Despite the support for CBT and other evidenced based interventions such as interpersonal psychotherapy, treatment efficacy for eating disorders is moderate at best (Brambilla, Amianto, Dalle Grave, & Fassino, 2014; Juarascio, Manasse, Espel, Kerrigan, & Forman, 2015). For example,
one study found that treatment outcome was only positive for half the participants when examining follow-up data within an anorexia population (Carter et al., 2011). Additionally, data for bulimia shows that nearly 6 to 37% drop out of either individual or group CBT (Shapiro et al., 2007). Considering these findings, researchers and clinicians have begun to tailor and adapt interventions to more effectively target the underlying components of eating disorder pathology.

Comprehensive, transdiagnostic models of eating disorders are needed because of the highly heterogeneous and comorbid nature of eating disorders. Many of the behaviors exhibited in eating disorders have been theorized to be maintained by problematic desires to control one’s self and environment (Fairburn, Shafran, & Cooper, 1999). It is an opportune time to further identify and understand the underlying cognitive-affect processes that may play a role in the development and maintenance of eating disorder pathology (e.g., Hill, Masuda, & Latzman, 2013; Lampard & Sharbanee, 2015; Manlick, Cochran, & Koon, 2013). Several maladaptive regulation strategies have been associated with eating disorder pathology including rumination, avoidance, and emotion inhibition (Damiano, Reece, Reid, Atkins, & Patton, 2015). Psychological inflexibility and cognitive rigidity have been identified as underlying components which contribute to the development, maintenance, and may serve as targets in the treatment of an eating disorder (Manlick et al., 2013). Psychological inflexibility describes an unwillingness to experience distressing, unwanted internal experiences (e.g., thoughts, emotions, sensations), treating the internal experiences literally, and increased efforts to alter, change, or avoid these experiences, rather than focusing on meaningful activities (Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

Psychological inflexibility has been well-researched in the area of eating disorders (Ferreira, Pinto-Gouveia, & Duarte, 2011; Hill et al., 2013; Masuda, Le, & Cohen, 2014; Masuda, Price, Anderson, & Wendell, 2010; Rawal, Park, & Williams, 2010; Wendell, Masuda, & Le, 2012). There is broad evidence for the relationship between psychological inflexibility and eating disorder symptomatology amongst non-clinical and clinical disordered eating populations (e.g., Merwin et al., 2010; Rawal et al., 2010), as well as disordered-eating cognitions and poor mental health (Masuda et al., 2010; Masuda & Wendell, 2010). Specifically, disordered eating cognitions and psychological inflexibility account for poor psychological health more than disorder cognitions alone (Masuda et al., 2010). Furthermore, psychological distress has been shown to be positively related to eating disorders, while psychological flexibility has been shown to be inversely related to both disordered eating cognitions and eating disorder symptomology (Masuda et al., 2014). Overall, there is considerable evidence that psychological inflexibility plays some role in predicting and maintaining disordered eating (Manlick et al., 2013). This study analyzed the effects of body image psychological inflexibility on outcomes for those in treatment for an eating disorder.

Recently, psychological inflexibility has been examined in eating disorder populations using a measure that conceptualizes psychological inflexibility regarding body image inflexibility (Body Image – Acceptance and Action Questionnaire: Sandoz, Wilson, Merwin, & Kellum, 2013). Body image inflexibility is a construct intended to measure the use of maladaptive regulation strategies while experiencing body dissatisfaction and disordered eating (Sandoz et al., 2013). In other words, high levels of body image flexibility fosters engagement in personally meaningful, values-consistent behavior, even while experiencing potentially unwanted or distressing internal experiences such as body dissatisfaction. It is theorized that the mere presence of eating disorder-related internal experiences may not result in eating disorder-related behaviors, but rather that eating disorder pathology is a result of how one responds to these experiences (Hill et al., 2013; Rawal et al., 2010).

Body image flexibility is associated with general psychological flexibility and eating disorder characteristics such as increased body acceptance, less disordered eating, and overall eating pathology (Sandoz et al., 2013). Body image flexibility has been shown to partially mediate disordered eating cognitions and disordered eating pathology (Wendell et al., 2012). While these results are promising, the vast majority of research using the BI-AAQ has utilized college or community samples. Therefore, the relationship between body image flexibility and eating disorders remains largely unknown within a clinical sample. Overall, research to date suggests that individuals suffering from an eating disorder often experience lower psychological flexibility, underscoring the need for research that examines body image flexibility in the context of clinical levels of disordered eating.

Recent studies have shown that treatments that target psychological inflexibility and body image inflexibility can result in meaningful reductions in eating disorders (Juarascio et al., 2013; Merwin et al., 2010). One such treatment, acceptance and commitment therapy (ACT) is useful in targeting these underlying cognitive processes. ACT is a modern, transdiagnostic cognitive behavior therapy that emphasizes acceptance, mindfulness, and valued living (Hayes, Strosahl, & Wilson, 2012). The theorized mechanism of action in ACT is psychological flexibility. Individuals who display greater psychological flexibility in response to eating disordered cognitions, emotions, and behaviors engage in less eating disordered behavior (Masuda et al., 2010). On the contrary, those who display greater emotional avoidance are related to those with more severe eating disorder pathology (Wildes, Ringham, & Marcus, 2010). Essentially, ACT’s approach to the treatment of eating disorders promotes acceptance of difficult internal experiences without attempting to alter, eliminate, or avoid these experiences, while moving in meaningful life directions.

Because ACT places such emphasis on values-directed behavior while deemphasizing more traditional attempts to reduce symptoms, it is important for ACT-related research to measure potential effects of improved psychological flexibility on quality of life. Eating disorders often have a serious impact on multiple domains that affect quality of life (Jenkins, Hoste, Meyer, & Blissert, 2011). These can include impacts on physical, mental, social, familial, and occupational functioning. Individuals with eating disorders have been shown to have lower levels of quality of life than the general population, those with former eating disorder diagnoses, and those with anxiety, mood, and somatiform disorders (De la Rie, Noordenbos, & Van Furth, 2005; Jenkins et al., 2011). The use of a quality of life measure in addition to a symptom severity measure as dependent variables in eating disorder research allows for a better understanding of the quantity and quality of treatment gains.

Taken together, further investigation regarding the role of psychological flexibility, in an eating disorder population, on symptom severity and quality of life is needed. Preliminary research is needed to identify predictors of treatment outcome within an eating disorder population and across age groups. Specifically, examining the relationship between psychological inflexibility and eating disorders would provide useful information for the interventions selected for this population. To date, research suggests that increases in psychological flexibility results in improved psychopathology and quality of life. In sum, identifying treatment predictors will provide valuable information in the conceptualization and treatment of eating disorders.

The purpose of the present study is to examine whether pre-treatment levels of body image inflexibility predict eating disorder quality of life and eating disorder risk at discharge from a residential treatment stay after controlling for baseline levels and age in a clinical eating disorder population. Given previous research it is predicted that higher levels of pre-treatment body image flexibility will significantly predict lower levels of eating disorder risk and higher levels of quality of life at discharge.

2. Method

2.1. Environment

Avalon Hills Eating Disorders Program is a for-profit residential facility located in the Western United States. The program provides
treatment for female adolescents (11 to 17 years old) and adults (18 years and older) who are medically stable at time of admissions. The primary treatment modalities include Cognitive Behavioral Therapy, Dialectical Behavior Therapy, ACT, and Applied Neuroscience. These are supplemented with martial arts, yoga, equine therapy, art, body image challenges, recreation, and other experiential interventions as well as behavioral stages of change system wherein progress in treatment is reinforced by gaining access to privileges. Patients attended daily group therapy, individual therapy at least twice a week, and family session once per week. There is no set duration of treatment as this is based on treatment progress and determined by the treatment team based on patient progress through a graded transition back into their home environment or an alternative lower level of care.

2.2. Participants

The analysis included 113 female patients who were diagnosed with an eating disorder as defined by the DSM-IV. These included anorexia nervosa (50.4%, n = 57), bulimia nervosa (17.7%, n = 20), and eating disorder not otherwise specified (31.9%, = 36). The majority of the patients were White (92.0%) and their ages ranged from 12 to 45 years old (M = 19.0, SD = 5.76). Patients were relatively evenly split between adolescents (55.8%) and adults (44.2%). See Table 1 for detailed patient demographics.

2.3. Procedures

The collection and utilization of the data in the current study received approval by an institutional review board. Informed consent/assent was attained for each of the patients prior to data collection. Participants completed a computerized intake assessment battery within their first week of treatment that evaluated anxiety, depression, eating disorder symptoms, and general functioning. This same assessment was completed within 72 h of discharge.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Participant demographics.</th>
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<tr>
<td></td>
<td>Adolescent (n = 63)</td>
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<tr>
<td>Age</td>
<td>15.19 (1.35)</td>
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<td>Eating disorder</td>
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<td>Anorexia nervosa</td>
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<td>Bulimia nervosa</td>
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<td>Married</td>
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</table>

2.4. Measures

2.4.1. Body image acceptance and action questionnaire (BIAAQ; Sandoz et al., 2013)

The BIAAQ is a 12-item self-report assessment based on the Acceptance and Action Questionnaire (Hayes et al., 2004), specifically tailored to measure body image flexibility. Items are rated on a 7-point Likert-type scale (1 = never true to 7 = always true). Higher scores denote greater levels of psychological flexibility. The measure has demonstrated good test-retest reliability over a two to three week period (r = 0.80), and good convergent and discriminant validity (Sandoz et al., 2013). The BIAAQ displayed excellent internal reliability in the current study (α = 0.93).

2.4.2. Eating disorder inventory 3rd edition (EDI-3; Garner, 2004).

The EDI-3 is a 91-item self-report assessment for individuals with eating disorders. Items are rated on a 6-point Likert-type scale (0 = never to 6 = always). The Eating Disorders Risk Composite (EDRC) is composed of the summed T scores for the Drive for Thinness, Bulimia, and Body Dissatisfaction scales of the EDI-3. It was the only portion of the EDI-3 utilized in the current study as it provides a global measure of eating and weight concerns. The EDRC has successfully predicted the emergence of eating disturbances and has been shown to play a role in the development of eating disorders (Garner, 2004). The EDRC has demonstrated excellent test-retest reliability over a one-week period (r = 0.98) and good convergent and discriminant validity.

2.4.3. Eating disorder quality of life (EDQOL; Engel et al., 2006).

The EDQOL is a 25-item self-report measure of health related quality of life specifically developed for eating disorder populations. Items are rated on a 5-point Likert-type scale (0 = never to 4 = always). Lowers scores indicate greater quality of life. The measure has demonstrated high test-retest reliability over a one week period (r = 0.93) and good convergent and discriminant validity (Engel et al., 2006). The EDQOL displayed excellent internal reliability in the current study (α = 0.92).

2.5. Analytic approach

Data were analyzed using SPSS 20.0 software. First, pairwise t-tests were performed to identify any significant differences in scores for all measures from intake to discharge. Next, Pearson’s r correlations were calculated between each of the measures at intake and discharge, as well as participant age at intake to assess for associations between these variables. Finally, to test whether pre-treatment levels of body image inflexibility predicted posttreatment eating disorder quality of life and eating disorder risk after controlling for baseline effects and then age, a sequential multiple regression analysis, along with tests of distributional properties and outlier problems, were performed. The variable Age showed substantial positive skewness and was therefore transformed by taking the inverse (1/Age).

3. Results

Mean intake and discharge scores for each of the measures are displayed in Table 2. Significant differences were found between intake and discharge for each of the measures. EDRC and EDQOL scores significantly decreased and demonstrated large effect sizes, indicating that, on average, patients’ risk decreased t(112) = 10.46, p < 0.01, d = 0.99) and quality of life increased t(112) = 12.68, p < 0.01, d = 1.30) from pre- to post-treatment. BI-AAQ significantly increased and demonstrated a moderate effect size t(112) = -9.60, p < 0.01, d = 0.51), indicating that, on average, patients’ body image flexibility increased from pre- to post-treatment. Correlations amongst study variables are displayed in Table 3. All but one paired relation demonstrated significant moderate to large correlations. EDQOL and EDRC scores are
positively correlated with each other; whereas BI-AAQ scores are negatively correlated with both EDQOL and EDRC. BI-AAQ scores are positively correlated from pre- to post-treatment.

In order to better understand these relationships, a sequential multiple regression was utilized. Unstandardized regression coefficients ($B$), standardized regression coefficients ($\beta$), incremental semipartial correlation coefficients ($sr^2$) and $R^2$ change statistics for these analyses are shown in Table 4. For the model testing EDQOL as the outcome variable, $R$ was significantly different from zero after steps one and three. After step three, in which baseline scores of EDQOL, age, and BI-AAQ were all entered into the equation, the adjusted $R^2$ indicated that approximately 19% of the variation in post-treatment EDQOL scores is attributable to age and pre-treatment psychological inflexibility. The incremental change in $R^2$ between steps 2 and 3 was significant, $F_{inc} (1, 109) = 4.209, p < 0.05$, suggesting that pre-treatment higher body image inflexibility significantly predicted higher post-treatment EDQOL scores after accounting for the effects of age.

For the model testing post-treatment EDRC scores as an outcome, $R$ was significantly different from zero after all three steps. When all three variables (pre-treatment EDRC, age, and BI-AAQ) were entered into the equation after step three, the adjusted $R^2$ of 0.292 indicated that nearly 30% of the variation in post-treatment EDRC scores is attributed to age and pre-treatment body image inflexibility. The incremental change in $R^2$ between steps 2 and 3 was significant, $F_{inc} (1, 110) = 4.367, p < 0.05$, indicating that higher pre-treatment body image inflexibility significantly predicted lower post-treatment EDRC scores after accounting for the effects of age.

### 4. Discussion

The purpose of this study was to assess the role of body image psychological flexibility in the response of females to treatment for eating disorders in a residential treatment center. Results showed that, while controlling for age, greater pre-treatment psychological inflexibility predicted greater post-treatment quality of life scores (19%) and lower posttreatment eating disorder symptoms (30%). Pre-treatment Body Mass Index was also explored, however it did not significantly contribute to the results ($p > 0.05$).

Findings from this study suggest that both age and body image flexibility are related to treatment outcomes. First, age accounted for much of the variance in the eating disorder quality of life and eating disorder risk composite score at post-treatment. This finding is notable considering that research is inconclusive on what may be the most significant predictor for treatment outcome in eating disorders (Vall & Wade, 2015). A recent meta-analysis examining predictors of treatment outcome found that individuals with an older age of onset or a shorter duration of eating disorder pathology had better outcomes post-treatment (Vall & Wade, 2015). As previous research suggests treatment outcomes should be considered in the context of age within an eating disorder population (Shapiro et al., 2007). Taken together, results from this study highlight the importance of considering age and duration of eating disorder pathology when selecting an intervention.

Results suggest that BI-AAQ resulted in a small, yet significant predictor of treatment outcomes in an eating disorder population. Understanding the role of body image psychological inflexibility is important for many reasons, including the ability to inform us about clinical options. Knowing that body image psychological inflexibility is present in eating disorders is useful from a prediction standpoint. This data highlights that an individual’s relationship to their thoughts, feelings, emotions around body image at pre-treatment have some influence on how well people do in treatment. Thus, interventions that target body image psychological flexibility may have better outcomes at post-treatment and follow-up. Additionally, results from this study suggest that body image psychological inflexibility may be a maintaining factor in eating disorders.

Findings from this study are in line with previous research. Specifically, research shows that psychological inflexibility is positively correlated with measures of eating disorder symptoms in a college population (Shapiro et al., 2007).
population (Rawal et al., 2010) and disordered eating cognitions and overall psychological health (Masuda et al., 2014; Masuda et al., 2010; Masuda & Wendell, 2010). Similar results were found for the BI-AAQ (Sandoz et al., 2013), which measures psychological inflexibility as it applies to body image (Hill et al., 2013). Body image psychological inflexibility has been shown to mediate the relationship between disordered eating cognitions and disordered eating pathology (Wendell et al., 2012) suggesting that how one responds to eating disorder cognitions may matter more than the mere presence of the cognitions. The only other study to look at the role of body image psychological inflexibility in an eating disorder population also used a residential population and showed that not only was the BI-AAQ strongly correlated with eating disorder severity, but that change scores for body image psychological inflexibility and change scores in eating disorder severity were also strongly correlated (Butryn et al., 2013).

There is a substantial amount of research showing that reductions in psychological inflexibility are strongly related to reductions in psychological issues (Hayes, Levin, Plumb-Vilarada, Villatte, & Pistorello, 2013). Thus, compiling all this research suggests that psychological inflexibility predicts eating disorders, that reductions in psychological inflexibility predicts reductions in eating disorders, and that greater pretreatment levels of psychological inflexibility predicts greater response to treatment. Findings have led researchers to offer acceptance and mindfulness-based treatment such as ACT as a possible treatment option for eating disorders (Manlick et al., 2013). ACT is a transdiagnostic cognitive behavior therapy that focuses on building psychological flexibility. Even though this line of research is growing, there are a handful of studies showing that ACT is a viable treatment for eating disorders (e.g., Hill, Masuda, Melcher, Morgan, & Tewhiq, 2015; Juarascio et al., 2013; Pearson, Follette, & Hayes, 2012). The findings from the current study suggest that ACT might be most applicable for those who enter treatment with greater psychological inflexibility.

As with all studies, there are limitations that could be addressed in future research. First, these data were collected as part of the actual treatment at a residential treatment center. As such the actual treatment that was received, as well as the duration it was received in, varies across participants. However, length of stay and number of stays at the treatment center did not influence post-treatment quality of life or eating disorder risk ($p > 0.05$). Relatedly, no fidelity was collected on the treatment that was delivered. Second, and similarly, while there was homogeneity in demographic variables, there was also heterogeneity in terms of age and clinical presentation. Thus, what this study gains in external validity it loses in internal validity. Third, the study is only a pretreatment to posttreatment design. Inclusion of a later data point would allow the assessment of maintenance, BI-AAQ change scores, and mediation analyses. Fourth, it is possible for the results from the current study to vary across specific eating disorder types, however the sample size for each subtype is too small to detect changes. Future studies should examine the influence of body image psychological flexibility on post-treatment outcomes.

The current findings provide further evidence that psychological flexibility, specifically, body image flexibility might play a role in eating disorder treatment outcomes. While further research is needed to more thoroughly examine this process as a mechanism of change throughout treatment, the current result indicate that levels of body image flexibility are a factor to consider prior to treatment. Furthermore, interventions should consider that target body image flexibility should be considered for individuals when entering treatment with rigid, inflexibly, beliefs related to body image. Lastly, this study highlights the importance of identifying predictors of treatment outcome in efforts to improve the treatment of eating disorders across age groups.

References

Conflict of interest
No conflict declared.

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