Title

Multi-Dimensional Self-Esteem and Magnitude of Change in the Treatment of Anorexia Nervosa

**Short Title**

Self – esteem in Anorexia Nervosa

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**Abstract**

Self-esteem improvement is one of the main targets of inpatient eating disorder programmes. The present study sought to examine multi-dimensional self-esteem and magnitude of change in eating psychopathology among adults participating in a specialist inpatient treatment programme for anorexia nervosa. A standardised assessment battery, including multi-dimensional measures of eating psychopathology and self-esteem, was completed pre- and post-treatment for 60 participants (all white Scottish female, mean age = 25.63 years). Statistical analyses indicated that self-esteem improved with eating psychopathology and weight over the course of treatment, but that improvements were domain-specific and small in size. Global self-esteem was not predictive of treatment outcome. Dimensions of self-esteem at baseline (Lovability and Moral Self-approval), however, were predictive of magnitude of change in dimensions of eating psychopathology (Shape and Weight Concern). Magnitude of change in Self-Control and Lovability dimensions were predictive of magnitude of change in eating psychopathology (Global, Dietary Restraint, and Shape Concern). The results of this study demonstrate that the relationship between self-esteem and eating disorder is far from straightforward, and suggest that future research and interventions should focus less exclusively on self-esteem as a uni-dimensional psychological construct.

**Keywords:** Anorexia Nervosa, Self-esteem, treatment outcome, inpatient treatment

**1. Introduction**

The concept of self-esteem is concerned with a person’s most basic, general, evaluative feelings about him/herself (O’ Brien and Epstein, 1988). Individuals with eating disorders are widely regarded as lacking in self-esteem, and research findings support the pivotal role of low self-esteem as a predisposing, precipitating, and perpetuating factor (e.g., Fairburn et al., 1999; Gual et al., 2002; Jacobi et al., 2004). Silverstone (1992) proposed that low self-esteem is a pre-requisite to an eating disorder, and that aetiological factors leading to eating disorders all act via low self-esteem. Several studies have revealed low self-esteem in patients with anorexia nervosa specifically (Cervera-Enguix et al., 2003; Jacobi et al., 2004; Silverstone, 1990; Wilksch and Wade, 2004). Low self-esteem has been found to be a significant predictor of early drop out (Halmi et al, 2005), poor treatment outcome (Halvorsen and Heyerdahl, 2006), and co-morbidity in anorexia nervosa (Karatzias et al., 2010).

There have been ongoing concerns that the concept of self-esteem was poorly defined and measured, with many self-esteem instruments correlating poorly with one another(Blascovich & Tomaka, 1993). The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965)is a widely-used measure in the eating disorder literature, with good reliability (Blascovich & Tomaka, 1993). However, studies using RSES within anorexic populations at pre- and post-treatment have demonstrated conflicting results. For example, Karpowicz et al. (2009) reported that self-esteem, as measured by RSES, significantly improved in line with eating psychopathology, as measured by the Eating Disorders Inventory-2 (EDI-2; Garner, 1991) from pre- to post-treatment, in a specialist eating disorders service. In contrast, Mehl et al. (2013) found that whilst BMI and quality of life had significantly increased after Multi-Family Therapy, RSES self-esteem had significantly decreased. This demonstrated the potential negative impact of recovery from eating disorders: patients may experience a sense of loss, as they no longer have the disorder as a coping mechanism to regulate underlying issues, such as suppressed negative emotions. Additionally, self-esteem in anorexia may be contingent on low body weight. This incongruity has been supported by findings from qualitative studies that patients with anorexia nervosa feel proud, powerful, special, and superior, in reaction to their weight loss (Garner and Bemis, 1982; Serpell et al., 1999).

As discussed, most eating disorder studies have employed the uni-dimensional measure RSES. Tafarodi and Swann (1995), however, combined the theory of the dualistic nature of self-esteem with the results of factor analyses of the uni-dimensional RSES, in order to conceptualise a two-dimensional Self-liking and Self-competence Scale (SLSC). Furthermore, researchers have proposed that these broad dimensions may contain multiple specific dimensions characterising facets of self-esteem. Few studies have employed a bi-dimensional measure of self-esteem when investigating eating disorders. In a longitudinal study of 77 participants receiving inpatient treatment, Surgenor et al. (2007) investigated the association between self-liking and self-competence, and symptoms of anorexia nervosa. At pre-treatment, severity of eating disorder disturbance (EDI total score) was significantly, negatively, associated with both self-liking and self-competence. Eating psychopathology, BMI, and self-competence significantly improved over the treatment episode, while self-liking tended towards improvement. Interestingly, one in three participants reported reduced self-liking or self-competence post-treatment. Change in total EDI was significantly negatively correlated with change in both self-esteem dimensions. Change in specific eating disorder symptoms were also differentially associated with change in self-esteem dimensions, leading the authors to conclude that different symptoms have different effects on self-esteem. This study demonstrated the utility of investigating self-esteem as a dynamic, two-dimensional variable, however, the short average treatment episode (M=50 days) may limit detectable changes over time. Furthermore, the self-esteem dimensions were extrapolated from Tafarodi and Swann’s (1995) bi-dimensional conception of the purported uni-dimensional RSES.

In the current study, an established multi-dimensional measure of self-esteem is employed, to better investigate the associations among facets of self-esteem and eating psychopathology. We will thus determine whether components of self-esteem have differential predictive power for changes in eating psychopathology, and, accordingly, have different implications for treatment. Drawing on previous findings on uni-dimensional and bi-dimensional self-esteem, the current research hypothesises that multi-dimensional self-esteem will improve after inpatient treatment for anorexia, concurrent with BMI and eating psychopathology. We also hypothesise that associations will exist between dimensions of self-esteem and eating psychopathology, at pre- and post-treatment. Finally, we hypothesise that both baseline, and magnitude of change in, multi-dimensional self-esteem will predict magnitude of change in eating psychopathology. The unique contribution of this study to the literature is two-fold: Firstly, in its consideration of self-esteem as a multi-faceted construct, and secondly, in its consideration of the impact of both baseline self-esteem, and changes in self-esteem over time, on the changes observed in eating psychopathology.

**2. Methods**

*2.1 Participants*

The sample for this study was the same as that used in a study reported by Collin et al (2010) and consisted of 80 of 208 consecutive admissions to an adult inpatient eating disorders unit with a primary diagnosis of anorexia nervosa. Diagnosis according to DSM-IV criteria (American Psychiatric Association, 1994) was confirmed by the nurse manager of the unit during the first week following admission using the Structured Clinical Interview for DSM-IV (SCID; First et al., 2002), which has good inter-rater reliability for eating disorders (Lobbestael et al., 2010).

Unless considered by the clinical team to be too unstable, or incapable of giving informed consent, all patients diagnosed with anorexia nervosa aged 18 or over were approached by a research assistant and invited to participate in the study. Patients were advised that participation was voluntary and that non-participation would not affect their treatment in any way. A total of 91 admissions opted to participate. As nine patients participated twice and one participated three times, this constitutes a sample of 80 unique patients. Only data from first admissions were included in analyses to ensure independence of data.

Of the remaining 118 admissions that did not participate in the study, 69 were deemed ineligible for reasons including: age, diagnoses of bulimia nervosa or binge eating disorder, significant addiction problems or psychosis, or having been admitted for short crisis intervention only. Another 39 cases declined to participate in the study for personal reasons, and 10 cases were missed due to staff absences.

All participants were female and the majority were either single, separated or divorced (83.3%), and living with parents (60.0%). The mean age of participants was 25.63 years (SD = 7.04) and many were in some form of education (36.7%). Of the 60 admissions comprising the sample, 55.8% were of the restricting subtype of anorexia nervosa and 44.2% were of the binge-eating/purging subtype, and the mean BMI on admission was 14.91 (SD = 2.42). The mean age of eating problem onset reported was 17.09 years (SD = 4.81), with an average duration of eating disorder of 8.63 years (SD = 7.80). Of the sample, 46.7% had received inpatient treatment for their eating problem on at least one previous occasion.

*2.2 Treatment programme*

The Eating Disorders Service at Priory Hospital Glasgow comprises a 27-bedded, specialist, high dependency unit, providing intensive, multidisciplinary, inpatient treatment for patients with severe and complex eating disorders and their co-morbid conditions. The programme encompasses a wide range of both individual and group therapies such as anxiety management and relaxation, problem solving, self-awareness and body image work, and social skills and assertiveness training, combined with specialist dietetic management including eating pattern normalisation and weight restoration, art therapy, drama therapy, and behavioural milieu adaptations aimed at addressing eating disorder symptoms. Interventions are highly structured and predominantly cognitive-behavioural.

Of the 80, 60 (75.0%) completed their treatment, while 20 patients dropped out prior to discharge, and their data are therefore excluded from analyses. The average length of treatment episode for these 60 admissions was 140.0 days (SD = 64.2)

*2.3 Measures*

Participation in the study involved completing a battery of standardised assessment measures, as detailed below. Demographic and historical information was also obtained. Members of the nursing team routinely monitored and recorded BMI throughout treatment, using the formula: weight in kilograms divided by height in metres squared.

*2.3.1 Eating Disorder Examination (EDE; (Cooper and Fairburn, 1987).*Regarded as the ‘gold-standard’ assessment of eating disorder symptomatology, the EDE is a semi-structured, investigator-based, clinical interview that comprehensively assesses the severity of dietary restraint and concerns about eating, shape and weight, of the preceding 28 days. Responses are rated on a seven-point scale, with higher scores representing more psychopathology. The EDE contains a measure of global eating psychopathology, as well as four subscales (Dietary Restraint, Eating Concern, Shape Concern and Weight Concern), and frequency measures of binge eating and compensatory behaviours. The good internal consistency, concurrent and discriminant validity, and interrater reliability of the EDE have been well documented in adults.

*2.3.2 Multi-Dimensional Self-Esteem Inventory (MSEI; O’ Brien & Epstein, 1988).* The MSEI is a 116 question self-report measure, which identifies eight areas of life experience which impact on self-esteem. The eight self-esteem dimensions fit conceptually within two subtypes of self-worth (body appearance, likability, lovability, moral self-approval) and self-competence (body functioning, competence, personal power, self-control). The MSEI also incorporates a measure of global self-esteem, and a measure of cohesiveness of self-concept (identity integration). Participants rate items on a five-point scale grading how accurately an item reflects them, and how often they experience an item, respectively.

The MSEI has been used with both community (Droney and Brooks, 1993; Frederick and Grow, 1996) and psychiatric (Lysaker et al., 2008) samples. The internal consistency of the MSEI was measured in a community sample with reported reliability coefficients, Cronbach’s alpha, of >0.80 for all sub-scales except defensive self-enhancement, which was 0.78 (O’ Brien and Epstein, 1988). Test-retest reliability correlations were reported above 0.85 for all sub-scales except likability (0.79) and identity integration (0.78). The MSEI was found to have high levels of convergent-discriminant validity when compared with measures of one-dimensional self-esteem (O’ Brien and Epstein, 1988).

*2.4 Procedure*

After giving written consent, study participants were required to complete the battery of standardised assessment measures within approximately one week of admission and within approximately one week of discharge. The research assistant was specifically trained in administration of the EDE, and was also available to assist with the completion of the self-report measures. Approval for the study was obtained externally, from the University of Stirling Ethics Committee.

*2.5 Data analysis*

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 18. Means (SDs) were calculated for continuous variables and frequencies (%) for categorical variables. Improvements over time in BMI, EDE scores, and MSEI scores were investigated using t-test analysis and Cohen’s d. Associations among pre-treatment BMI, EDE scores, and MSEI scores, and post-treatment scores of the same measures, were investigated using Pearson’s correlations.

Multiple linear regression analyses were undertaken to explore the role of self-esteem in treatment outcome. The first series of analyses used the mean change scores in BMI, and EDE measures from pre- to post-treatment as the outcome variables, and the MSEI subscales at Time 0 as the predictor variables. A further series of multiple regression analyses was undertaken with the same outcome variables, using MSEI subscale mean change scores as the predictor variables. All predictor variables were entered regression analysis simultaneously in order to investigate the effects of individual variables while controlling for the effects of all other variables. Pearson’s correlations were used to check for multi-collinearity amongst predictors, as none exceeded 0.7 this was not an issue.

**3. Results**

*3.1 Does multi-dimensional self-esteem improve post-treatment?*

Pre- and post-treatment means for BMI, EDE scores, and MSEI scores are illustrated in Table 1. Statistically significant improvements were detected for BMI and all EDE subscales at post-treatment. Statistically significant improvements were also detected for MSEI global and all subscales of MSEI. Effect sizes were medium to large for BMI and EDE subscales. However, effect sizes for MSEI subscales were small, with the exception of a medium effect size for Body Appearance and Identity Integration.

One third (n=20) of participants reported decreases in global self-esteem. Decreases in specific facets of self-esteem occurred in 23-56% of participants post-treatment.

 (Insert Table 1 here)

*3.2 What is the relationship between multi-dimensional self-esteem, BMI, and eating psychopathology pre- and post- treatment?*

Associations between BMI, EDE subscales, and MSEI subscales at pre- and post-treatment are illustrated in Tables 2 and 3. The Benjamini-Hochberg False discovery Rate correction was employed to control for Type I error rates in multiple comparisons. Any correlations present were inverse, such that as EDE scores and BMI increase, MSEI scores decrease. At pre-treatment, Lovability was the only MSEI subscale to form significant associations with BMI and all EDE subscales. MSEI Global was significantly associated with all EDE subscales, including Global, but not with BMI. Likability was associated with all EDE subscales apart from Eating Concern. Self-control and Body Functioning were significantly associated with all EDE subscales apart from Dietary Restraint. Identity Integration was significantly associated with Shape Concern, Weight Concern, and Global. Body Appearance was significantly associated with Global and Shape Concern. Competence was significantly associated with Shape Concern and Weight Concern, while Personal Power was significantly associated with Weight Concern only.

At post-treatment, a different pattern of associations between BMI, EDE subscales, and MSEI subscales emerged. MSEI Global, Lovability, Likability, Self-Control, Moral Self-approval, Body Functioning, and Identity Integration formed significant associations with all EDE subscales, including Global, but not BMI. In fact, BMI did not form significant associations with any MSEI subscale at post-treatment. MSEI Competence was significantly associated with EDE Global, Shape Concern and Weight Concern. Finally, Body Appearance was significantly associated with EDE Eating Concern, Shape Concern, Weight Concern, and Global.

 (Insert Tables 2 and 3 here)

*3.3 Does baseline multi-dimensional self-esteem significantly predict magnitude of change in eating psychopathology?*

A series of linear regression analyses were undertaken testing MSEI facets, at Time 0, as predictor variables, and change scores of EDE facets and BMI as outcome variables, to observe the prognostic value of Multi-Dimensional Self-Esteem in eating disorder outcomes. Regression analyses revealed that Lovability was a statistically significant predictor of EDE Shape Concern (Beta = -0.41, t = -2.1, p= 0.025), and EDE Weight Concern (Beta = -0.35, t = -2.1, p = 0. 045). No MSEI subscales significantly predicted change in BMI or the remaining subscales of EDE.

*3.4 Does magnitude of change in multi-dimensional self-esteem significantly predict magnitude of change in eating psychopathology?*

A further series of linear regression analyses were undertaken, testing mean change scores in MSEI facets as predictor variables, and change scores of EDE facets and BMI as outcome variables, to observe relationships amongst changes in facets of self-esteem and eating disorder outcomes. MSEI Self-Control was found to predict change in EDE Global (Beta= -0.33, t= -2.31, p= 0.025) and change in EDE Shape concern (Beta= -0.31, t=-2.05, p=0 .046). No other subscales significantly predicted change in BMI or the remaining subscales of EDE.

**4. Discussion**

The current study aimed to explore the associations between multi-dimensional self-esteem and eating disorder symptoms in the context of an inpatient treatment programme. The results demonstrate complex associations between these variables, and indicate that certain facets of self-esteem may be more relevant than others in eating disorder outcomes.

There is an assumption in the literature that any changes occurring in self-esteem and eating disorder features will be in the same direction (e.g., Silverstone, 1992), but our first main finding challenges this. Generally, self-esteem, eating psychopathology, and weight improved concurrently. However, not all self-esteem domains improved over time, and those that did exhibited small effect sizes. It is perhaps unsurprising that in an inpatient anorexia nervosa treatment setting, greater changes are seen in weight and eating psychopathology, than in the stable personality trait, self-esteem. Body Appearance was the only self-esteem facet to display a medium effect size, and this may be the most susceptible to eating disorder intervention as it parallels changes in eating psychopathology. As in the Surgenor et al. (2007) study, one in three participants reported a reduction in self-esteem over the treatment episode, despite improvements in eating psychopathology and BMI, indicating that improvements in self-esteem may depend on the individual and their stage of recovery. It has been documented that improved eating disorder status is not always experienced as positive by the recipient of that improvement, and this is supported by our results (Serpell et al., 1999; Surgenor et al., 2003).

The second main finding was that, at pre- and post-treatment, self-esteem was associated with eating psychopathology as measured by the EDE. With the exception of Lovability, it was not, however, associated with BMI. This is consistent with the Surgenor et al. (2007) findings, and suggests that the association between anorexia nervosa and self-esteem occurs via the activities involved (e.g., dietary restraint, excessive preoccupation with eating, shape, and weight), which may function as distracting coping mechanisms, rather than through weight loss. Lask and Frampton (2009) argue that eating disorder professionals ‘tend to hold the same morbid preoccupation with weight, BMI, and targets’ as eating disorder patients, with many clinicians viewing weight restoration as the main aim of treatment. Geller et al. (1997) suggest that shape- and weight-based self-esteem is an important target for treatment, but these results indicate that a focus on different facets of self-esteem, as well as on emotion-regulation strategies, may be more beneficial in approaching eating disordered patients holistically.

A novel result of this study is the differential associations found between facets of multi-dimensional self-esteem and eating psychopathology. Whilst previous studies (e.g. Cervera-Enguix et al., 2003) have simply indicated associations between eating psychopathology, and self-esteem more broadly, the associations formed between specific facets of self-esteem indicate that these constructs may be particularly relevant in the development of eating disorder symptoms. Whilst at pre-treatment, Lovability, Likability, Self-Control, and Body Functioning, are correlated with multiple aspects of eating psychopathology, an altered pattern is formed at post-treatment, indicating that the associations between self-esteem and eating psychopathology change over the course of treatment. Specifically, Moral Self-approval is not associated with EDE at pre-treatment, but at post-treatment it is significantly negatively associated with all subscales. Additionally, Eating Concern exhibits more associations with multi-dimensional self-esteem at post-treatment than pre-treatment. Building a knowledge base about these multi-dimensional associations allows a clearer picture to be formed which may inform approaches to treatment. This evidence for differential relationships amongst these facets and eating psychopathology provides support for utilising a model accounting for multi-faceted self-esteem, as it may be more informative in some contexts than the uni-dimensional approach.

Our final set of findings concern the predictive ability of self-esteem on treatment outcome. Overall, the results indicate that pre-treatment self-esteem does not significantly predict inpatient anorexia nervosa treatment outcome. The finding that Global self-esteem does not significantly predict inpatient anorexia nervosa treatment outcome is consistent with a longitudinal study by Fichter et al. (2003), wherein low self-esteem was associated with high levels of eating psychopathology at pre-treatment for anorexia nervosa, but had no impact on six-year outcome. It may be unlikely that the stable trait self-esteem will drive behaviour, but it may instead exert its influence by mediating relationships between other psychological factors at play in anorexia nervosa. For example, Paterson et al. (2010) found self-esteem to be a mediating factor in the development of positive or negative social problem-solving in individuals with anorexia nervosa.

Qualitative research has supported an association between increased self-esteem and recovery from eating psychopathology, wherein women in recovery cite reaching self-acceptance, and cultivating a sense of self-worth, as critical to recovery (Federici and Kaplan, 2008; Patching and Lawler, 2009; Vanderlinden et al., 2007). Indeed, interventions aimed at improving self-esteem are considered integral ingredients of modern eating disorder treatment approaches such as cognitive behaviour therapy (Fairburn, 2008; Garner et al., 1997), and motivational enhancement therapy (Feld et al., 2001; Vitousek et al., 1998), with some arguing for the development of a treatment approach focusing solely on improving self- esteem (Newns et al., 2003). The treatment programme in the current study was cognitive-behavioural in orientation and encompassed skills such as anxiety management, social skills, and self-awareness, which may have contributed to the improvements in self-esteem experienced by most participants. However, our results demonstrate that the relationship between self-esteem and eating disorders is far from straightforward, and question the extensive focus on uni-dimensional self-esteem in the eating disordered population.

Upon examining the predictive ability of multidimensional facets of self-esteem, more complex patterns emerged, which may provide important implications for assessment and treatment in eating disorders. MSEI Lovability at baseline was predictive of magnitude of change in aspects of eating psychopathology, specifically EDE Shape Concern and Weight Concern, respectively. This corresponds with Surgenor et al. (2007), who found that increased self-liking was associated with decreased drive for thinness at the end of treatment. These results indicate a specific prognostic value for this facet of self-esteem, and indicate the value of assessing multi-dimensional self-esteem in an eating disorder population. Using magnitude of change in MSEI facets as predictors, it was found that change in MSEI Self-Control predicts magnitude of change in EDE Global and EDE Shape Concern. Thus, patients who improve on measures of self-control over treatment may display greater improvement on these measures of eating psychopathology. This demonstrates the utility of monitoring changes in Self-Control over treatment, in understanding progress in eating disorder recovery. In general, awareness of patients’ pre-treatment profiles of multidimensional self-esteem could highlight specific problem areas, and contribute to tailoring interventions to their needs. Furthermore, assessment of change over treatment in specific facets of self-esteem, such as self-control, could indicate progress in eating disorder recovery, or highlight areas where further work is needed. The results of the current study indicate that some facets of self-esteem may be more useful as targets in eating disorder treatment than others, and increasing our understanding of these specific associations can allow the development of highly effective interventions.

Limitations of the current study include its small sample size. That only 80 patients opted to participate in the study, and 20 dropped out prior to discharge, impacts on the generalisability of results. The sample was also relatively small for the number of independent variables that were entered into the regression analysis, with Tabachnick and Fidell (2001) recommending a sample size of n > 114 for a regression analysis with 10 predictors. This may have impacted on the study’s power to detect effects. There was no control group, and it would be of interest to explore the comparative relevance of the multiple self-esteem dimensions for other pathologies, or for an anorexia nervosa outpatient sample. The current study explored the predictive effect of self-esteem variables on eating psychopathology, but it is also possible to explore the opposite interpretation of this association, as in Surgenor et al. (2007). Vitousek and Manke (1994) have argued that the impairments in anorexia nervosa may render responses, to assessment of stable personality factors, unrepresentative of their personality outside of the illness. The administration of both assessor- and self-rated measures in the present study reduced the likelihood of this. Furthermore, the self-esteem measure employed was established and multi-dimensional rather than retrospectively constructed and bi-dimensional.

The results of the present study demonstrate that there are complex associations between self-esteem and eating psychopathology, and question the extensive focus on self-esteem and weight in the eating disordered population. That self-esteem can either increase, or decrease, post-treatment, demonstrates the individual nature of pathways to recovery. Our finding that self-esteem was associated with eating psychopathology but not with weight gain should inform practice, where there is an over-preoccupation with BMI. Our findings that both baseline, and change over treatment, in MSEI facets are differentially predictive of treatment outcomes, indicate that ongoing assessment of these constructs can inform treatment approaches, and can be used to monitor progress. Currently, there is limited information on associations between anorexia nervosa and wider psychological constructs, and future research should focus on understanding the factors that are responsible for the origin and maintenance of the condition.

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Table 1. Pre- and post- treatment means (SDs) and comparisons

|  |  |  |  |
| --- | --- | --- | --- |
| ***Measure*** | ***Mean (SD)*** |  |  |
|  | ***Pre-treatment******(n = 60)*** | ***Post-treatment******(n = 60)*** | ***Comparison******(df = 59)*** | ***Cohen’s d*** |
| ***BMI*** | 14.9 (2.4) | 19.6 (1.9) | t = -12.1, p < 0.001 | 2.0 |
| ***EDE*** |  |  |  |  |
| *Dietary restraint* | 4.5 (1.4) | 1.6 (1.6) | t = 13.5, p < 0.001 | 1.8 |
| *Eating concern* | 4.3 (1.4) | 1.9 (1.5) | t = 11.3, p < 0.001 | 1.7 |
| *Shape concern* | 4.7 (1.6) | 3.5 (1.9) | t = 5.6, p < 0.001 | 0.7 |
| *Weight concern* | 4.2 (1.7) | 3.0 (2.0) | t = 5.6, p < 0.001 | 0.7 |
| *Global* | 4.4 (1.3) | 2.5 (1.7) | t = 10.4, p < 0.001 | 1.3 |
| ***MSEI*** |  |  |  |  |
| *Global* | 17.4 (6.3) | 20.4 (7.3) | t = -3.3, p = 0.002 | 0.4 |
| *Competence* | 26.1 (8.2) | 28.5 (7.4) | t = -3.5, p = 0.001 | 0.3 |
| *Lovability* | 28.3 (7.4) | 30.0 (7.8) | t = -2.0, p = 0.046 | 0.2 |
| *Likability* | 22.8 (7.1) | 24.6 (7.8) | t = -2.2, p = 0.030 | 0.2 |
| *Self-control* | 28.1 (7.4) | 29.6 (7.5) | t = -2.1, p = 0.040 | 0.2 |
| *Personal power* | 23.1 (8.3) | 26.2 (9.1) | t = 3.7, p < 0.001 | 0.4 |
| *Moral self-approval* | 33.3 (7.8) | 35.2 (8.2) | t = -2.4, p = 0.022 | 0.2 |
| *Body appearance* | 17.0 (5.9) | 20.8 (7.9) | t = 3.9, p < 0.001 | 0.5 |
| *Body functioning*  | 21.1 (6.2) | 23.7 (7.2) | t = -2.9, p = 0.005 | 0.4 |
| *Identity integration* | 21.5 (6.8) | 24.9 (7.5) | t = -4.0, p < 0.001 | 0.5 |
| **Notes: Cohen (1988) provides the following guidelines for interpreting effect size d "small, d = 0.2 " "medium, d = 0.5," and "large, d =0 .8"** |

Table 2. Associations between self–esteem, BMI and eating psychopathology at pre- treatment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ***BMI*** | ***Global*** | ***Dietary restraint*** | ***Eating concern*** | ***Shape concern*** | ***Weight concern*** |
| ***Global*** | r = -0.08 | r = -0.42\*\* | r = -0.31\* | r = -0.31\* | r = -0.47\*\*\* | r = -0.39\*\* |
| ***Competence*** | r = 0.02 | r = -0.25 | r = -0.17 | r = -0.13 | r = -0.29\* | r = -0.28\* |
| ***Lovability*** | r = -0.30\* | r = -0.51\*\*\* | r = -0.42\*\* | r = -0.38\*\* | r = -0.49\*\*\* | r = -0.50\*\*\* |
| ***Likability*** | r = -0.11 | r = -0.42\*\* | r = -0.33\* | r = -0.26 | r = -0.42\*\* | r = -0.43\*\* |
| ***Self-control*** | r = -0.13 | r = -0.41\*\* | r = -0.28 | r = -0.37\*\* | r = -0.42\*\* | r = -0.39\*\* |
| ***Personal******power*** | r = 0.02 | r = -0.22 | r = 0.10 | r = -0.17 | r = -0.21 | r = -0.29\* |
| ***Moral self-approval*** | r = -0.25 | r = -0.16 | r = -0.12 | r = -0.18 | r = -0.23 | r = -0.06 |
| ***Body appearance*** | r = -0.04 | r = -0.30\* | r = -0.20 | r = -0.19 | r = -0.39\*\* | r = -0.27 |
| ***Body functioning*** | r = -0.05 | r = -0.38\*\* | r = -0.28 | r = -0.32\* | r = -0.40\*\* | r = -0.34\*\* |
| ***Identity integration*** | r = 0.02 | r = -0.34\*\* | r = -0.15 | r = -0.24 | r = -0.33\* | r = -0.44\*\*\* |
| **Notes: \*p<0.026, \*\*p<0.01,\*\*\*p<0.001**A Benjamini-Hochberg False Discovery Rate correction was applied to account for the increased type I error rate in multiple comparisons (Benjamini & Hochberg, 1995). The accepted level of significance after this correction was 0.026.  |

Table 3. Associations between self–esteem, BMI and eating psychopathology at post- treatment

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ***BMI*** | ***Global*** | ***Dietary restraint*** | ***Eating concern*** | ***Shape concern*** | ***Weight concern*** |
| ***Global*** | r = -0.05 | r= -0.54\*\*\* | r = -0.41\*\* | r = -0.49\*\*\* | r = -0.56\*\*\* | r = -0.53\*\*\* |
| ***Competence*** | r = -0.11 | r = -0.29\* | r = -0.23 | r = -0.23 | r = -0.30\* | r = -0.29\* |
| ***Lovability*** | r = -0.06 | r = -0.36\*\* | r = -0.31\* | r = -0.39\*\* | r = -0.34\*\* | r = -0.30\* |
| ***Likeability*** | r = -0.16 | r = -0.40\*\* | r = -0.32\* | r = -0.38\*\* | r = -0.42\*\* | r = -0.37\*\* |
| ***Self-control*** | r = 0.06 | r = -0.40\* | r = -0.37\*\* | r = -0.37\* | r = -0.36\*\* | r = -0.39\*\* |
| ***Personal******power*** | r = -0.21 | r = -0.16 | r = -0.12 | r = -0.09 | r = -0.20 | r = -0.15 |
| ***Moral self-approval*** | r = 0.13 | r = -0.39\* | r = -0.42\*\* | r = -0.37\* | r = -0.31\* | r = -0.36\*\* |
| ***Body appearance*** | r = -0.05 | r= -0.46\*\*\* | r = -0.26 | r = -0.46\*\*\* | r = -0.49\*\*\* | r = -0.47\*\*\* |
| ***Body functioning*** | r = -0.15 | r= -0.50\*\*\* | r = -0.34\*\* | r = -0.45\*\*\* | r = -0.58\*\*\* | r = -0.46\*\*\* |
| ***Identity integration*** | r = 0.13 | r = -0.52\*\*\* | r = -0.46\*\*\* | r = -0.48\*\*\* | r = -0.51\*\*\* | r = -0.50\*\*\* |
| **Notes: \*p** <**0.035, \*\*p<0.01,\*\*\*p<0.001**A Benjamini-Hochberg False Discovery Rate correction was applied to account for the increased type I error rate in multiple comparisons (Benjamini & Hochberg, 1995). The accepted level of significance after this correction was 0.035. |